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PROGRESS REPORT ON THE FUNGUS DISEASES OF SCALE INSECTS ATTACKING CITRUS IN FLORIDA

F. E. FISHER, W. L. THOMPSON, and J. T. GRIFFITHS, JR.
Citrus Experiment Station, Lake Alfred, Florida

THE "FRIENDLY FUNGI"

Since 1897 when Rolfs (6) published "A Fungus Disease of the San Jose Scale," *Sphaerostilbe coccophila* Tul.[1] and several other fungi have been credited with being of great value in controlling scale insects attacking citrus in Florida. Numerous investigators (1, 2, 7, 8, 9) following Rolfs have published papers on the efficacy of the fungus diseases; however, throughout the available literature, no one has reported seeing one of the "friendly fungi" actually growing on a living scale insect. Without evidence of the parasitism of these fungi their economic importance to the grower is in question.

It has been noted by the authors that purple scale (*Lepidosaphes beckii* Newm.) populations often decrease very rapidly. Holloway and Young (4) have indicated that the scarcity or abundance of entomogenous fungi[2] has no influence on the rate of total mortality of these insects. If this be true, then some other factor must be responsible for the periodic epizootics.

THE "FRIENDLY FUNGI."—The term "friendly fungi" is generally used to include the following fungi associated with scale insects, as listed by Watson and Berger (9): Red-Headed Scale Fungus (*Sphaerostilbe aurantiicola* (Berk. & Br.) Petch), Pink-Headed Scale Fungus (*Nectria diploa* Berk. & Curt.), White-Headed Scale Fungus (*Podonectria coccicola* (Ell. & Ev.)

[1] According to T. Petch (Brit. Myc. Soc. Trans. 7: 109-129. 1921) the correct name for this fungus is *S. aurantiicola* (Berk. & Br.) Petch.

[2] *Nectria diploa* Berk. & Curt. and *Sphaerostilbe aurantiicola* (Berk. & Br.) Petch.

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Petch), Black Scale Fungus (*Myriangium floridanum* Hoehm.), and Cinnamon fungus (*Verticillium cinnamomeum* Petch).

During 1947 and 1948 the red-headed and the pink-headed fungi have been found in abundance, whereas the other "friendly fungi" were found occasionally, but they were not common. This paper will deal with *Sphaerostilbe aurantiicola* (Berk. & Br.) Petch and *Nectria diploa* Berk. & Curt. both of which are incorporated under the general term, red-headed scale fungi.

INOCULATION EXPERIMENTS WITH RED-HEADED SCALE FUNGI.—All attempts to inoculate red and purple scale insects (respectively, *Chrysomphalus aonidum* L. and *Lepidosaphes beckii* Newm.) which were reared in the laboratory on grapefruit have failed. Spores, both from cultures and from mature fruiting bodies, in water suspensions were sprayed on first, second, and third stages of both red and purple scale insects. Some of the grapefruit were maintained under ordinary laboratory conditions while others were in a moisture chamber. In a series of five experiments in the laboratory there was no mortality of the insects which could be attributed to the red-headed scale fungi.

In two experiments, young pineapple orange trees which were infested with purple scale insects were sprayed with a water suspension of spores from mature fruiting bodies. There was no resulting mortality.

RED-HEADED FUNGUS COUNTS.—Evidence has been found that it is possible for the red-headed fungi to act as saprophytes. These fungi frequently have been observed growing entirely on the armors of dead scale insects, and also on the armors of insects which were alive and healthy.

In conjunction with spraying experiments, counts of purple scale insects and red-headed fungi were made to determine the length of time required for the fungi to begin their saprophytic growth on the dead insects. Table 1 shows a comparison of three spraying treatments and one non-sprayed plot in terms of percentages computed from counts made on June 5, 1947, five weeks after spraying. Each plot consisted of five trees.

In Table 1 the saprophytic growth of the red-headed fungi is illustrated by the large number of fungi per 100 living scales in plot 1 which received an oil-emulsion spray. In comparison with plot 1, plot 2, sprayed with copper-oil-emulsion, had a smaller percentage of fungi. This might be attributed to a larger percentage of living scale in plot 2, and to the fungicidal

action of the copper. There seem to be no significant differences, in the number of fungi per 100 living scales, between the copper-zinc-lime-wettable sulfur spray (plot 3) and the non-sprayed control (plot 4). All four plots are comparable in the average number of fungi per 100 dead scales. In the percentage of fungi which were associated with dead and living scales, plot 1, which received an oil-emulsion spray, and plot 2, which received a copper-oil-emulsion spray, had a higher percentage of fungi than did the copper-zinc-lime-wettable sulfur (plot 3) and the non-sprayed control (plot 4).

TABLE 1.—THE RELATIONSHIP BETWEEN THE RED-HEADED FUNGUS, *Sphaerostilbe aurantiicola* (Berk. & Br.) Petch AND LIVING AND DEAD PURPLE SCALE INSECTS, *Lepidosaphes beckii* Newm.

Plot No.	Treatment	Percentage of Living Scales	Percentage of Fungus Associated with Dead and Living Scales	Average Number of Fungi per 100 Dead Scales	Average Number of Fungi per 100 Living Scales
1	Oil-emulsion	3.31	73.5	81.02	2,220.00
2	Copper-oil-emulsion	17.14	65.55	83.29	307.80
3	Copper, zinc, lime, and wettable sulfur	47.95	45.96	91.72	92.13
4	Control	42.14	41.40	88.27	77.98

CHYTRIDIOSIS OF SCALE INSECTS

An economically important disease of purple scale insects is caused by the endoparasitic chytrid, *Myiophagus* sp. Thaxter. Karling (5) has termed this disease chytridiosis. As far as is known, this chytrid was first found parasitizing purple scale insects on citrus in Florida by W. L. Thompson in the fall of 1934 at Babson Park. At that time the parasitized insects were abundant. Although the fungus has been plentiful during the intervening years, identification attempts failed until 1946 when, with the aid of Dr. Ernst A. Bessey,[3] it was identified as a species of *Myiophagus* by Fisher (3).

DISTRIBUTION OF CHYTRIDIOSIS.—In Florida the distribution of chytridiosis is widespread and is known to occur throughout the interior citrus belt, as far south as Lake Placid and as far

[3] Professor of Botany, Retired, Michigan State College.

north as Palatka and Mandarin, and in the Indian River section.

HOST RANGE.—The following hosts have been recorded in Florida: purple scale (*Lepidosaphes beckii* Newm.), red scale (*Chrysomphalus aonidum* L.), chaff scale (*Parlatoria pergandii* Comst.), and long scale (*Lepidosaphes gloverii* Pack.).

Karling (5) lists *Myiophagus ucrainicus* (Wize) Sparrow as being parasitic in: the larvae and pupae of *Cleonus punctiventris* and *Anisoplia austriaca* in the Ukraine (Wize); dipterous pupae, Kittery Point, Maine (Thaxter) and Yorks, England (Petch); *Lepidosaphes beckii* and *L. Newsteadi,* Bermuda (Waterston); *L. ulmi,* Ontario, Canada (Waterston); *L. beckii* in Louisiana, U. S. A. (Karling); and the artificial inoculation of *Pseudococcus longispinis* and *P. citri* in New York (Karling).

THE LIFE HISTORY OF *Myiophagus* sp.—Purple scale insects with chytridiosis are easily recognized in the early stages of the disease while the insects are still alive. The first indication of the disease is a slight color change of the body which is normally white to a pale, coral-pink tint. Later, as the disease progresses and the insect dies, the zoosporangia develop internally giving the scale a bright orange color. After the insect is dead, the zoosporangia mature, and the insect's body becomes a powdery mass of golden-yellow zoosporangia. If resting zoosporangia are present, all or part of the body may be brick-red in color.

When sufficient moisture is present to wet the leaves thoroughly, the zoosporangia in the dead scales germinate producing swimming zoospores which swim in the film of water until they come into contact with a healthy scale, and then produce germ tubes which penetrate the integument (5) of the insect. In this manner healthy scales become infected and all subsequent growth of the parasite is internal. Zoosporangia are again produced, at the expense of the insect's life, and the subsequent release of zoospores completes the life cycle of the fungus.

RATE OF MORTALITY CAUSED BY CHYTRIDIOSIS.—The life cycle of *Myiophagus* sp. makes it readily apparent that not only is the fungus directly dependent upon the density and distribution of the scale population, but also upon moisture without which infection of the scales is impossible. Especially in the summer months when purple scale populations are increasing and rains are frequent, high mortality of the scales may be caused by

chytridiosis. During 1947 and 1948 weather conditions were favorable for this disease.

In Grove W (Figure 1), which is a typical example of several orange groves on a non-spraying program, purple scales apparently were effectively controlled by chytridiosis. Counts have been made in this grove over a period of 19 months. Scale

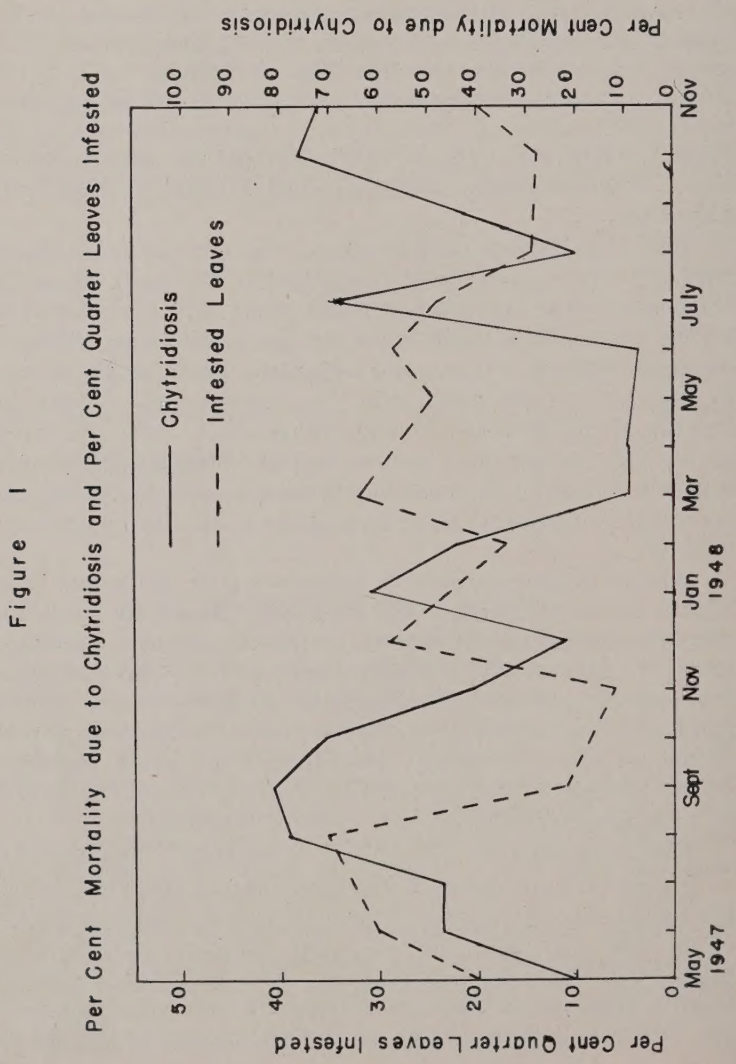


Figure 1

TABLE 2.—A COMPARISON OF THE PURPLE SCALE, *Lepidosaphes beckii* Newm., POPULATIONS AND THE RATE OF MORTALITY CAUSED BY *Myiophagus* sp. IN TWO NON-SPRAYED CONTROL PLOTS AT THE CITRUS EXPERIMENT STATION, LAKE ALFRED, FLORIDA.

1948 Month	Plot 1		Plot 2	
	Mortality Ratio	Per Cent of Quarter Leaves Infested	Mortality Ratio	Per Cent of Quarter Leaves Infested
April	7.79	23.3	3.15	.....
June	4.21	60.0	14.38	53.3
August	38.81	19.3	27.21	22.7
September	90.16	6.7	86.32	8.0
November	78.23	6.7	79.70	7.3

population counts were based on an examination of ¼ of the leaf surfaces of each of 50 leaves per tree and were recorded as the average percent of quarter leaves infested. Identifiable males were not counted in either the scale infestation counts or in computing chytridiosis incidence. During the latter part of August, 1947, scale mortality reached its highest point of the summer. At that time, on scale counts of 30 heavily infested leaves, there were 434 diseased scales per 100 healthy scales; a mortality percentage [4] of 81.28. The following month there was a decrease in the scale population. In general, Figure 1 shows that periods of scale population decrease or low incidence were usually preceded by or coincident with a high degree of chytridiosis. Low scale populations were usually followed by decreases in chytridiosis incidence. Thus, an increase in the number of scales parasitized by *Myiophagus* sp. appeared to cause a decrease in the scale population, and as the scales died, the amount of mortality due to chytridiosis decreased. However, in October and November, 1948, a marked increase in the number of scales with chytridiosis did not result in a further decrease of the scale population, but actually the scale

[4] The percentage of mortality was computed by dividing the total number of diseased scales plus the total number of living scales into the total number of diseased scales, and multiplying the resulting figure by 100.

population showed a slight increase. This discrepancy emphasizes the fact that a more complete understanding of the effect of scale population density on subsequent incidence of chytridiosis and other related factors is essential before competely accurate interpretation can be made of the available data.

Table 2 shows a comparison of the purple scale populations and the rate of mortality caused by *Myiophagus* sp. in two non-

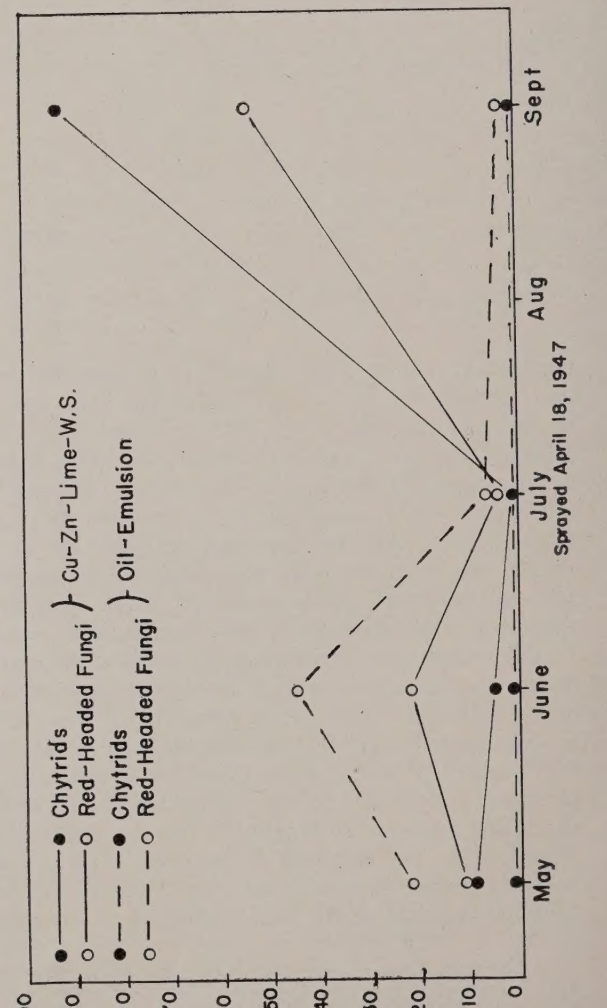


Figure 2

Comparisons between the Number of Purple Scales Attacked with Chytridiosis and the Number of Purple Scales Attacked by the Red-Headed Fungi

sprayed control plots at the Citrus Experiment Station, Lake Alfred, Florida. Plot 1 did not receive any spraying treatments during 1947 or 1948. Plot 2 was not sprayed during 1948. Each plot consisted of five pineapple orange trees.

From April through November plot 1 and plot 2 (Table 2) are comparable. In August and September, plot 1 had a smaller per cent of infested leaves, and a larger percentage of scale mortality than did plot 2. The rate of mortality caused by chytridiosis, in both plot 1 and plot 2, during August does not seem to be sufficient to explain the decrease of the per cent of infested leaves. In these two plots it must be concluded that some factor other than chytridiosis was partially responsible for the decrease in the total number of infested leaves between June and August.

MORTALITY CAUSED BY CHYTRIDIOSIS COMPARED WITH THE NUMBER OF RED-HEADED FUNGI ATTACKING PURPLE SCALE INSECTS.—Figure 2 shows a comparison between the number of purple scales attacked with chytridiosis and the number of purple scales attacked by the red-headed fungi during the summer of 1947 in two plots at the Citrus Experiment Station, Lake Alfred, Florida. In the copper-zinc-lime-wettable sulfur sprayed plot the number of red-headed fungi closely followed the number of scales with chytridiosis. In the oil-emulsion sprayed plot the number of red-headed fungi reached its highest point five weeks after spraying while the number of scales attacked with chytridiosis was very low throughout the summer. The oil-emulsion spraying so effectively controlled the purple scale infestation that there were only a few living scales remaining for *Myiophagus* to attack.

Hirsutella sp.

It has been observed by the authors that occasionally large numbers of purple scale crawlers, *Lepidosaphes beckii* Newm., become yellow in color and a high mortality follows. Crawlers which were exhibiting this off-color and apparently living have been examined and found to contain yeast-like bodies. In examinations of dead crawlers only one fungus has been found consistently associated with the yellow-colored crawlers. This fungus has been tentatively identified as a species of *Hirsutella* Pat. Whether or not the mycelium of *Hirsutella* sp. growing out of the dead crawlers originates from the yeast-like bodies found inside of the living crawlers remains to be proved.

SUMMARY

For a number of years a diversity of opinion has existed as to whether or not some of the so-called "friendly fungi" (*Sphaerostilbe aurantiicola* (Berk. and Br.) Petch. and *Nectria diploa* Berk. and Curt.) actually parasitize scale insects. During 1947 and 1948 no evidence has been found that the red-headed fungi do parasitize red or purple scale insects. It has been established that these fungi have the ability to act as saprophytes, but their ability to act as parasites has not been proved.

The endoparasitic fungus, *Myiophagus* sp. Thaxter, which causes chytridiosis of scale insects has been found widely distributed throughout the citrus belt in all purple scale (*Lepidosaphes beckii* Newm.) infestations which have been examined. In 1947 and 1948 this disease has been of greater importance in purple scale populations than it has in red scale (*Chrysomphalus aonidum* L.) populations.

Although there are some groves in which the purple scale insects appeared to be effectively controlled by chytridiosis, biological control of scale insects by dependence solely upon *Myiophagus* sp. is not advocated. Not only is the fungus directly dependent upon the density and distribution of the scale population, but also upon moisture without which infection of the scales is impossible. Further study is necessary in order to determine methods which may be used to increase the efficacy of these diseases in coordination with the artificial control measures.

A fungus associated with dead purple scale crawlers has been tentatively identified as a species of *Hirsutella* Pat.

LITERATURE CITED

1. Berger, E. W. Fungus parasites of hard or armored scales. Fla. Agr. Exp. Sta. Press Bull. **83**. 1908.

2. Fawcett, H. S. Citrus diseases and their control. 2nd Ed. McGraw-Hill, New York. 656 pp. 187 figs., incl. 15 col. pls. 1936.

3. Fisher, F. E. Insect disease studies. Fla. Agr. Exp. Sta. Ann. Rept. p. 162. 1947.

4. Holloway, J. K. and Young, T. R. The influence of fungicidal sprays on entomogenous fungi and on the purple scale in Florida. J. Econ. Ent. **36**: 453-457. 1943.

5. Karling, J. S. Chytridiosis of scale insects. Amer. J. Bot. **35**: 246-254. 1948.

6. Rolfs, P. H. A fungus disease of the San Jose scale. Fla. Agr. Exp. Sta. Bul. **41**. 1897.

7. Rolfs, P. H. and Fawcett, H. S. Fungus diseases of scale insects and whitefly. Fla. Agr. Exp. Sta. Bull. **94**. 1908.

8. Watson, J. R. Utilization of fungus parasites of Coccidae and Aleurodidae in Florida. J. Econ. Ent. **5**: 200-204. 1912.

9. Watson, J. R. and Berger, E. W. Citrus insects and their control. Fla. Agr. Exp. Sta. Bull. **88**. 1937.

AN ANNOTATED BIBLIOGRAPHY OF NORTH AMERICAN THYSANOPTERISTS: PART II

By STANLEY F. BAILEY
University of California, Davis, California

It is always a great temptation to describe new species instead of doing the more difficult revisional and basic work. Unless this latter type of work is done, the systematics of many genera of thrips will reach an impasse. Zimmerman (Insects of Hawaii, V. 2, page 392, 1948) pertinently remarks "The Thysanoptera are largely in a state of taxonomic chaos, and the group is a most difficult one to work with systematically. There is not yet available a classification which can be considered adequate or natural. The basic concept of what constitutes the various categories of classification appears more often than not to have been lost sight of. Few authorities agree as to what constitutes a genus, subfamily, family or superfamily."

On the other hand, it is necessary to describe the species that come to hand in order that the diversification in a genus as well as the relationships of genera may be seen. It is only then that the higher groups may be arranged in proper sequence. In many other orders of insects, a large number of systematists have brought this desired condition about earlier than in the Thysanoptera. The burden of describing thrips has fallen largely upon a few individuals from whose efforts future workers will profit.

We cannot overestimate the value of carefully made illustrations when new species of thrips are described. Those of Hood are among the very best and are of the greatest value. Hood (1932c) so well stated this point that he should be quoted: "Finally, it should be stated that in no group of insects are carefully executed, accurate illustrations of new forms more to be desired than in the Thysanoptera. No two workers agree exactly in their selection of structures to be described, and a

good common denominator for the work of all would be illustrations of at least the head, prothorax, and antenna of every new species made known. If such drawings are not provided, I fear that the group will soon be in such chaotic condition that worthwhile revisional or monographic work will be impossible."

Furthermore, it is almost impossible today to describe new valid species in many genera such as *Liothrips, Trichothrips, Frankliniella,* and *Thrips* without reviewing the entire genus (including an examination of types) and often modifying the original concept. The describing of new species in these and other large genera of thrips from unique specimens is most undesirable. Over twenty years ago Hood (1927d) clearly emphasized this second important point: in improving descriptive work one should employ a "larger series of paratypes, so that other specialists may be provided with actual specimens, rather than with descriptions which can never be adequate for the simple reason that new characters and new differences, not mentioned in the original diagnoses, are continually being discovered."

The writings of Professor J. Douglas Hood on the taxonomy of thrips have covered a period of thirty-three years (1908-1941) and include to date 129 titles listed below. Because of the large number of publications and species described by Hood, we are listing the Terebrantia and Tubulifera separately. He has described to date ninety-five genera and six hundred and ninety-seven species. In addition, the Aeolothripoidea, Phlaeothripoidea, Thripoidea, Urothripoidea, Pygothripidae, Merothripidae, and Hyidiothripinae were established by Hood. It is unfortunate that Professor Hood has not had the time to check this summary of his works, but it is as complete as we can make it at present. Sub-genera are treated here as genera. We have recorded the published synonymy as far as we are able and made certain additional notes. Where possible to ascertain the dates of issue or mailing dates of the publications, we have listed them for convenience should it be necessary in the future to establish priority.

PUBLICATIONS ON THRIPS by J. Douglas Hood

1908a.—Aug. 22.—New Genera and Species of Illinois Thysanoptera. Bul. Ill. State Lab. of Nat. Hist., Urbana, Ill. 8 (Art. II): 361-379, figs. 1-9.

1908b.—Sept. 3.—Three new North American Phloeothripidae. Can. Ent. 40 (9): 305-309, figs. 15-19.

1908c.—Dec.—Two new species of *Idolothrips*. Ann. Ent. Soc. Amer. 1 (4): 285-289, figs. 9 and 10.

1909a.—Jan.—Two new North American Phloeothripidae. Ent. News. 20 (1): 28-32, figs. 1-4.

1909b.—Feb.—Two new North American Phloeothripidae. Corrections. Ent. News. 20 (2): 75.

1909c.—June.—A new genus and a new species of North American Phloeothripidae, (Thysanoptera). Ent. News. 20 (6): 249-252, fig. 1, a-b.

1912a.—Mar. 19.—Three new Phloeothripidae (Thysanoptera) from Texas and Michigan. Proc. Biol. Soc. Wash. 25: 11-16, figs. 1-4.

1912b.—Apr. 13.—New genera and species of North American Thysanoptera from the South and West. Proc. Biol. Soc. Wash. 25: 61-76, Pl. IV and figs. 1-6.

1912c.—May 8.—On North American Phloeothripidae (Thysanoptera) with descriptions of two new species. Can. Ent. 44 (5): 137-144, Pl. VI, figs. 1-4; Pl. VII, figs. 1, a-c, 2.

1912d.—July-Sept.—Descriptions of new North American Thysanoptera. Proc. Ent. Soc. Wash. 14 (3): 129-160, Plates IV-VIII. (Issued Sept 30.)

1912e.—Aug.—A new genus and three new species of North American Thysanoptera. Psyche. 19 (4): 113-118, Pl. 8, figs. a-d; Pl. 9, figs. a-c.

1913a.—June 30.—Nine new Thysanoptera from the United States. Proc. Biol. Soc. Wash. 26: 161-166.

1913b.—June 30.—Two new Thysanoptera from Porto Rico. Insec. Ins. Mens. 1 (6): 65-70, Pl. I, figs. 1-5.

1913c.—Aug.—On a collection of Thysanoptera from Panama. Psyche 20 (4): 119-124, figs. 1-4.

1913d.—Sept. 12.—A new species of *Heliothrips* (Thysanoptera) from Maryland and Illinois. Can. Ent. 45 (9): 308-311, figs. 11-12.

1913e.—Dec. 31.—On a collection of Thysanoptera from Porto Rico. Insec. Ins. Mens. 1 (12): 149-154, Pl. V, figs. 1-4.

1914a.—Feb. 9.—*Prosopothrips cognatus*, a new North American Thysanopteron. Can. Ent. 46 (2): 57-59, fig. 13, a. b.

1914b.—Feb. 28.—Notes on North American Thysanoptera, with descriptions of a new family and two new species. Insec. Ins. Mens. 2 (2): 17-22, Pl. I, figs. 1-4.

1914c.—Mar.—Studies of the Arizona Thurberia Weevil on cotton in Texas. By B. R. Coad and W. D. Pierce. Proc. Ent. Soc. Wash. 16 (1): 29. (Note: Hood lists this paper as "Paper No. 20".)

1914d.—Mar. 23.—On the proper generic names for certain Thysanoptera of economic importance. Proc. Ent. Soc. Wash. 16 (1): 34-44.

1914e.—Mar. 30—Two Porto Rican Thysanoptera from sugar cane. Insec. Ins. Mens. 2 (3): 38-41, figs. 1-2.

1914f.—Apr. 24.—Two new Thysanoptera from Panama. Insec. Ins. Mens. 2 (4): 49-53, figs. 1-2.

1914g.—Aug. 13.—Studies in Tubuliferous Thysanoptera. Proc. Biol. Soc. Wash. 27: 151-172, Pl. III, figs. 1-6, Pl. IV, fig. 1-7, Pl. V, figs. 1-4.

1915a.—Jan.-Apr.—Descriptions of new American Thysanoptera. Insec. Ins. Mens. 3 (1-4): 1-40, Pl. I, figs. 1-9, Pl. II, figs. 1-7. (Published May 15.)

1915b.—Mar. 12.—A remarkable new thrips from Australia. Proc. Biol. Soc. Wash. 28: 49-51, fig. 3, a-c.

1915c.—Mar. 12.—An outline of the subfamilies and higher groups of the insect order Thysanoptera. Proc. Biol. Soc. Wash. 28: 53-60.

1915d.—Apr.—On some America Aeolothripidae (Thysanoptera). Ent. News. 26 (4): 162-166, figs. a-b. (Mailed Mar. 31.)

1915e.—May.—*Hoplothrips corticis:* A problem in nomenclature. The Entomologist 48 (624): 102-107.

1915f.—June.—and C. B. Williams. New Thysanoptera from Florida and Louisiana. Jour. N. Y. Ent. Soc. 23 (2): 121-138, Pl. 7-10.

1915g.—June 11.—Some features in the morphology of the insect order Thysanoptera. Science, n. s. 41 (1067): 877.

1915h.—Aug. 14.—A new *Hoplandrothrips* (Thysanoptera) from British Guiana. Can. Ent. 47 (8): 241-244, fig. 26 (1-3).

1915i.—Sept. 18.—An interesting case of antennal antigeny in Thysanoptera. Proc. Ent. Soc. Wash. 17 (3): 128-132, Pl. XV, figs. 1-4.

1915j.—Oct.—Two new species of *Liothrips* (Thysanoptera). Bul. Brook. Ent. Soc. 10 (4): 76-79.

1916a.—Feb.—Two new Thysanoptera from West Africa, with a note on the synonomy of the Phloeothripidae. Psyche. 23 (1): 6-12, Pl. IV, figs. 1-7.

1916b.—Mar. 1.—A new species of *Heterothrips* (Thysanoptera) from Eastern United States. Ent. News. 27 (3): 106-108.

1916c.—Apr. 10.—A new *Physothrips* (Thysanoptera) from Uganda, with a note on *Physothrips antennatus* Bagnall. Can. Ent. 48 (4): 130-132.

1916d.—Apr.-June.—A synopsis of the genus *Oxythrips* Uzel. (Thysanoptera). Insec. Ins. Menst. 4 (4-6): 37-44.

1916e.—June 6.—Descriptions of new Thysanoptera. Proc. Biol. Soc. Wash. 29: 109-123, Pl. III, figs. 1-4.

1916f.—June.—*Oedaleothrips hookeri*, a new genus and species of Thysanoptera. Bul. Brook. Ent. Soc. 11 (3): 64-65, Pl. 2, figs. 1-3.

1916g.—July-Sept.—A new *Plectrothrips* (Thysanoptera) from Jamaica. Insec. Ins. Mens. 4 (7-9): 78-80, Pl. I, figs. 1-4. (Publication date Oct. 23.)

1917a.—Apr.—A new *Sericothrips* (Thysanoptera) from Africa. Bul. Brook. Ent. Soc. 12 (2): 32-34.

1917b.—Apr.-June.—An annotated list of the Thysanoptera of Plummer's Island, Maryland. Insec. Ins. Mens. 5 (4-6): 53-65. (Publication date June 2.)

1918a.—Apr. 10.—A new Physothrips from Western Africa. Insec. Ins. Mens. 6 (4-6): 116.

1918b.—Oct.—A new *Kleothrips* (Thysanoptera) from North Queensland. Bul. Brook. Ent. Soc. 13 (4): 76-79, Pl. 8, figs. 1-4.

1918c.—Dec. 19.—New genera and species of Australian Thysanoptera. Mem. Queensland Mus. 6: 121-150, Brisbane.

1919a.—Apr.-June.—On some new Idolothripidae (Thysanoptera). Insec. Ins. Mens. 7 (4-6): 66-74, Pl. II, figs. 1-6. (Publication date Apr. 1.)

1919b.—Apr. 1.—On some new Thysanoptera from Southern India. Insec. Ins. Mens. 7 (4-6): 90-103, Pl. III, figs. 1-6, Pl. IV, figs. 1-4.

1919c.—May 20.—Two new genera and thirteen new species of Australian Thysanoptera. Proc. Biol. Soc. Wash. 32: 75-91.

1924a.—June.—A new *Sericothrips* (Thysanoptera) injurious to cotton. Can. Ent. 56 (6): 149-150. (Mailed June 26.)

1924b.—June.—A new *Ankothrips* (Thysanoptera) from New Mexico. Bul. Brook. Ent. Soc. 19: 66-68. (Mailed May 28.)

1924c.—Nov.—New Thysanoptera from the United States. Ent. News. 25: 312-317.

1934d.—Dec.—On some new Phloeothripidae (Thysanoptera) from the Transvaal. Psyche. 31 (6): 293-301.

1925a.—Jan.—Four new Thysanoptera from Africa. Proc. Ent. Soc. Wash. 27 (1): 8-12.

1925b.—Feb. 25.—Four new Phloeothripidae (Thysanoptera) from New York. Bul. Brook. Ent. Soc. 20 (1): 26-32.

1925c.—Feb.—New Neotropical Thysanoptera collected by C. B. Williams. Psyche. 32 (1): 48-69.

1925d.—Apr. 14.—New species of *Franklinella* (Thysanoptera). Bul. Brook. Ent. Soc. 20 (2): 71-83, Pl. III, figs. 1-12.

1925e.—May.—Six new Thysanoptera from the Western United States. Ent. News. 36: 101-105, Apr.; 134-138, May.

1925f.—June.—Notes on New York Thysanoptera, with descriptions of new genera and species. I. Bul. Brook. Ent. Soc. 20 (3): 124-131. (Mailed Aug. 14.)

1925g.—June.—New species of *Taeniothrips* (Thysanoptera) from Africa. The Entomologist. 58: 132-139.

1925h.—Sept.—Four new Phleothripidae from the United States (Thysanoptera). Can. Ent. 57 (9): 218-222.

1926.—Thysanoptera. Reprint from "A preliminary biological survey of the Lloyd-Cornell Reservation near McLean, New York." Bul. Lloyd Library. Ent. Ser. No. 5, 1926, p. 94.

1927a.—Mar.—and C. B. Williams. A synopsis of the thysanopterous family Urothripidae. Ann. Ent. Soc. Amer. 20 (1): 1-9, Pl. I; Pl. II, figs. 1-5.

1927b.—March.—A contribution toward the knowledge of New York Thysanoptera with descriptions of new genera and species. II. Entomologica Americana, n.s. 7 (4): 209-245. Pl. XX, figs. 1-5, Pl. XXI, figs. 1-7. (Issued June 14.)

1927c.—Apr.—Nineteen synonyms in the North American Thysanoptera. Ent. News. 38 (4): 112-113.

1927d.—Apr.—On the synonymy of some Thysanoptera occurring in Cali-

fornia. Pan.-Pac. Ent. 3 (4): 173-178, fig. 1, a-b. (Mailing date June 9.)

1927e.—May.—Three new Phlaeothripidae (Thysanoptera) from the District of Columbia. Proc. Ent. Soc. Wash. 29 (5): 111-117, Pl. 5, figs. 1-7.

1927f.—June.—New Thysanoptera from the United States. Jour. N. Y. Ent. Soc. 35: 123-146, Pl. XIII, figs. 1-4, Pl. XIV, figs. 1-4.

1927g.—Sept.—A blood-sucking thrips. The Entomologist. 60 (772): 201.

1927h.—Dec. 2.—New western Thysanoptera. Proc. Biol. Soc. Wash. 40: 197-204.

1927i.—Dec.—New Neotropical Thysanoptera collected by C. B. Williams. II. Psyche. 34 (6): 230-246.

1928a.—Jan.—and G. W. Herrick. A list of the insects of New York. Order Thysanoptera. Memoir 101, Cornell Univ. Agr. Exp. Sta. pp. 66-72.

1928b.—June.—A new *Actinothrips* (Thysanoptera) from Brazil. Bul. Brook. Ent. Soc. 23 (3): 147-150, fig. 1, a-b. (Mailed Aug. 7.)

1929.—Dec.—Two *Urothripidae* (Thysanoptera) from Florida, with keys to the known genera and the North American species. Bul. Brook. Ent. Soc. 24 (5): 314-322, Pl. XXIX, figs. 1-9. (Mailed Jan. 6, 1930.)

1931a.—Feb.—A new genus and species of *Aeolothripidae* (Thysanoptera) from Chile. Bul. Brook. Ent. Soc. 26 (1): 1-3, fig. 1, a-c. (Mailed Apr. 2.)

1931b.—Apr.—Synonyms in the North American Thysanoptera. Pan-Pac. Ent. 7 (4): 170-172.

1931c.—Oct.—Notes on New York Thysanoptera, with descriptions of new genera and species. III. Bul. Brook. Ent. Soc. 26 (4): 151-170, Pl. VII, figs. 1-7, Pl. VIII, figs. 1-7. (Mailed Dec. 8.)

1932a.—Feb.—and Sabra J. Hook. Tergo-Sternal muscles in the Thysanoptera. Bul. Brook. Ent. Soc. 27 (1): 1-6, Pl. I-III. (Mailed Mar. 31.)

1932b.—Mar.—A new thrips from Plummer's Island, Maryland. Proc. Ent. Soc. Wash. 34 (3): 37-40, Pl. 5, figs. 1-4.

1932c.—June.—New species of the genus *Thrips* from Central Africa and Egypt. Bul. Soc. Roy. Ent. d'Egypt, fasc. 3, pp. 115-158, Seance du 21 Juin 1932, Planches III-XI.

1933a.—Apr.—*Rhabdothrips albus*, a new genus and species of Thysanoptera from Panama. Proc. Ent. Soc. Wash. 35 (4): 45-48, Pl. 3, figs. 1-5.

1933b.—Oct.—Three new species of *Thrips* Linné from the western United States. Pan-Pac. Ent. 9 (4): 173-182, Cut 1, figs. 1-4, Cut 2, figs. 1-4, Cut 3, figs. 1-4.

1933c.—Nov. 20.—Three new Urothripidae from Panama. Proc. Biol. Soc. Wash. 46: 213-215.

1933d.—Dec.—*Notothrips folsomi*, a new genus and species of Thysanoptera from the United States. Proc. Ent. Soc. Wash. 35 (9): 200-205, Pl. 9, figs. 1-4, Pl. 10, figs. 1-4.

1933e.—Dec.—New Thysanoptera from Panama. Jour. N. Y. Ent. Soc. 41: 407-434.

1934a.—Feb. 9.—Some further new Thysanoptera from Panama. Proc. Biol. Soc. Wash. 47: 57-81.

1934b.—Mar.—A new *Eurythrips* (Thysanoptera) from Trinidad. Psyche. 41 (1): 1-5, Pl. I, figs. 1-4.

1934c.—Apr. 14.—A new *Macrophthalmothrips* (Thysanoptera) from Tanganyika. Stylops. 3 (part 4): 84-87, figs. 1-3.

1934d.—May.—Two new genera and species of Phlaeothripidae (Thysanoptera). Proc. Ent. Soc. Wash. 36 (5): 111-120, Pl. 17, figs. 1-5, Pl. 18, figs. 1-4.

1935a.—May 3.—Ten new Thysanoptera from Panama. Proc. Biol. Soc. Wash. 48: 83-106, Pl. IV, figs. 1-5.

1935b.—June.—Some new or little-known Thysanoptera of the Family Phlaeothripidae. Rev. de Ent. 5 (2): 159-199, figs. 1-8.

1935c.—June.—Eleven new Thripidae (Thysanoptera) from Panama. Jour. N. Y. Ent. Soc. 43 (2): 143-172, Pl. XI, figs. 1-7; Pl. XII, figs. 1-5.

1935d.—June 19.—Five new Thysanoptera of the genus *Aeolothrips* (Aeolothripidae). Trans. Amer. Ent. Soc. 61 (2): 103-110, Pl. III, figs. 1-5.

1935e.—Sept. 14.—A note on Heterogony in the Thysanoptera, with descriptions of two new species from Tanganyika. Stylops. 4 (part 9): 193-201, figs. 1-3.

1935f.—Nov. 15.—The Thysanopterous genus *Actinothrips*. Stylops. 4 (part 2): 247-254, fig. 1, a-d, fig. 2, a-e.

1936a.—Mar.—Two new Thysanoptera from the United States. Psyche. 43 (1): 1-9, figs. 1, a-c, 2, a-b. (Mailed May 28, 1936.)

1936b.—May 1.—*Frankliniella gossypiana*, new name. Proc. Biol. Soc. Wash. 49: 68.

1936c.—June 1.—Nine new Thysanoptera from the United States. Jour. N. Y. Ent. Soc. 44 (2): 81-100, fig. 1, a-b. (Mailed June 25.)

1936d.—July 15.—Two new *Anactinothrips* from South America (Thysanoptera). Proc. Roy. Ent. Soc., London, ser. B, 5 (7): 143-147, fig. 1, a-b.

1936e.—July.—Studies in Neotropical Thysanoptera. I. Revis. de Ent. 6 (2): 248-279, figs. 1-4. (Date of publication July 15.)

1936f.—Oct.—Studies in Neotropical Thysanoptera. II. Rev. de Ent. 6 (3-4): 424-460, figs. 1-5. (Date of publication Oct. 30.)

1937a.—Jan.—New genera and species of Thysanoptera from South Africa. Ann. Mag. Nat. Hist. Ser. 10., 19: 97-113, figs. 1-3.

1937b.—Mar.—On some Thysanoptera from American conifers. Ent. News. 48 (3): 74-80, figs. a, b.

1937c.—Mar.—Studies in Neotropical Thysanoptera. III. Rev. de Ent. 7 (1): 96-115, figs. 1, a-l, 2, a-g. (Date of publication Mar. 30.)

1937d.—July.—A new *Melanthrips* (Thysanoptera) from South Africa. Ent. Mo. Mag. ser. 3, 23: 154-156, fig. 1, a-c.

1937e.—July.—Studies in Neotropical Thysanoptera. IV. Rev. de Ent. 7 (2-3): 255-296, figs. 1-7. (Date of publication July 24.)

1937f.—Aug. 7.—A new ant-like thrips from Florida. Proc. Biol. Soc. Wash. 50: 111-113.

1937g.—Oct.—Studies in Neotropical Thysanoptera. V. Rev. de Ent. 7 (4): 486-530, figs. 1-9. (Date of publication Oct. 11.)

1937h.—Dec.—A new *Euoplothrips* (Thysanoptera) from the Solomon Islands. Ann. Mag. Nat. Hist. ser. 10, 20: 599-604, fig. a, b.

1938a.—Feb. 18.—A new subgenus and species of Thysanoptera from the Cameroons. Proc. Biol. Soc. Wash. 51: 11-13.

1938b.—Feb. 18.—A new genus and species of Phlaeothripidae (Thysanoptera) from Palmetto. Proc. Biol. Soc. Wash. 51: 27-32.

1938c.—Insects of North Carolina. Order Thysanoptera, Thrips, pp. 55-58, Pub. by N. C. Dept. Agr. (Edited by C. S. Brimley.)

1938d.—Mar.—A new *Chirothrips* (Thysanoptera) from Cyprus. Ent. Mo. Mag. ser. 3, 24 (279): 56-59, fig. 1.

1938e.—Mar.—Studies in Neotropical Thysanoptera. VI. Rev. de Ent. 8 (1-2): 161-187, figs. 1-3. (Date of publication Mar. 26.)

1938f.—June.—New Thysanoptera from Florida and North Carolina. Rev. de Ent. 8 (3-4): 348-420. (Date of publication June 25.)

1938g.—July.—On some European species of *Chirothrips* (Thysanoptera). Ent. Mo. Mag. ser. 3, 24 (283): 158-164, fig. 1, a-b, 2, a-b.

1938h.—Sept.—Studies in Neotropical Thysanoptera. VIII. Rev. de Ent. 9 (1-2): 218-247, fig. 1. (Date of publication Sept. 27.)

1938i.—Sept.—Nine new Thysanoptera from North America. Amer. Midld. Nat. 20 (2): 354-367.

1938j.—Dec.—Seven new Phlaeothripidae from the United States. Bul. Brook. Ent. Soc. 33 (5): 205-218. (Mailed Jan. 13, 1939.)

1938k.—Dec.—Studies in Neotropical Thysanoptera. VIII. Rev. de Ent. 9 (3-4): 404-426. (Date of publication Dec. 31.)

1939a.—Sept.—Notes on *Chirothrips*, with descriptions of two new species (Thysanoptera). Rev. de Ent. 10 (2): 461-471. (Date of publication Sept. 4.)

1939b.—Dec.—New North American Thysanoptera, principally from Texas. Rev. de Ent. 10 (3): 550-619, fig. 1. (Date of publication Dec. 22.)

1939c.—A new *Polyphemothrips* (Thysanoptera) from Peru. Rev. Chilena Hist. Nat. 42: 217-200, fig. 20, a, b. Santiago. 1938.

1940a.—June.—A century of new American Thysanoptera. I Rev. de Ent. 11 (1-2): 540-583, fig. 1. (Date of publication June 28.)

1940b.—Aug.—*Organothrips bianchii*, a new Hawaiian thrips from Taro. Proc. Haw. Ent. Soc. (for the year 1939). 10 (3): 423-427, Pl. 24, figs. a-e.

1940c.—Sept.—Two new Heliothripinae (Thysanoptera) from the Transvaal. Jour. Ent. Soc. So. Afr. 3: 35-41, fig. 1, a-b.

1940d.—The cause and significance of Macropterism and Brachypterism in certain Thysanoptera, with description of a new Mexican species.

Ann. de la Escuela Nacional de Ciencias Biol. 1 (3-4): 497-505, figs. 1-2. (Ano de 1939.)

1940e.—A new *Teuchothrips* (Thysanoptera) from Mexico. Ann. de la Escuela Nacional de Ciencias Biol. 1 (3-4): 507-513, Pl. 76.

1941a.—July.—A century of new American Thysanoptera. II. Rev. de Ent. 12 (1-2): 139-243, figs. 1-11. (Date of publication July 31.)

1941b.—Dec.— A century of New American Thysanoptera. III. Rev. de Ent. 12 (3): 547-678, figs. 12-16. (Date of publication Jan. 31, 1942.)

LIST OF TEREBRANTIA Described by J. Douglas Hood

Aeolothrips annectans, 1916e. No. Amer. = *melaleucus* Hal., 1852. Priesner, 1926. Thys. Europas, p. 111.
bervicauda, 1935d. No. Amer.
crassus, 1912d. No. Amer.
faurei, 1935d. Africa.
kuwanaii var. *crucifer*, 1935d. No. Amer.
microstriatus, 1935d. Panama.
oculatus, 1927f. No. Amer.
oregonus, 1935d. No. Amer.
pallidicornis, 1938i. No. Amer.
vehemens, 1927f. No. Amer.
vittipennis, 1912d. No. Amer.
wetmorei, 1927f. No. Amer.

Anaphothrips amoenus, 1940a. No. Amer.
bicinctus, 1925c. Trinidad.
catawba, 1938f. No. Amer.
decolor, 1925e. No. Amer.
flavidus, 1925a. Africa.
limbatus, 1935c. Panama.
nanus, 1941a. No. Amer.
ripicola, 1940a. No. Amer.
spartina, 1939b. No. Amer.
speciosus, 1919c. Australia.
tenebrosus, 1938i. No. Amer.
zizania, 1928i. No. Amer.

Ankothrips diffractus, 1924b. No. Amer.

Arpediothrips Hood, 1927h. Genotype: *Arpediothrips mojave*.
mojave, 1927h. No. Amer.

Astrothrips angulatus, 1925c. Trinidad.
constrictus, 1925c. Trinidad.
pentatoma, 1925a. Africa.

Bregmatothrips Hood, 1912b. Genotype: *Bregmatothrips venustus*.
gracilis Hood and Wms., 1915f. No. Amer.
venustus, 1912b. No. Amer.

Chilothrips Hood, 1916e. Genotype: *Chilothrips pini*.
pini, 1916e. No. Amer.

Chirothrips auriventris, 1939a. No. Amer. = *texanus* Andre, 1939. (New synonymy to be credited to Andre who so informed the writer in

correspondence April 26, 1948.)
bagnalli, 1938g. Spain. (Holotype is part of type series of Bagnall's *Chirothrips similis* var. *productus*, 1932.)
bradleyi, 1941a. No. Amer.
crenulatus, 1927f. No. Amer.
cuneiceps, 1940a. No. Amer.
cypriotes, 1938d. Cyprus.
dorsalis, 1939b. No. Amer.
insolitus, 1915a. No. Amer.
insularis, 1938g. Cyprus.
lenape, 1938i. No. Amer.
orizaba, 1938i. No. Amer.
partruelis, 1940a. No. Amer.
productus, 1927f. No. Amer.
simplex, 1927f. No. Amer. = *falsus* Pr. Andre, 1939. Hood, 1939a.
spiniceps, 1915a. No. Amer.
talpoides, 1939a. No. Amer.
vestis, 1915a. No. Amer.
xanthius, 1933e. Panama.

Coremothrips Hood, 1925c. Genotype: *Coremothrips pallidus*.
pallidus, 1925c. Trinidad, Panama.

Corynothrips cruentatus, 1934a. Panama.

Desmothrips Hood, 1915c. Genotype: *Orothrips australis* Bagn., 1914. Ann. Mag. Nat. Hist. ser. 8, 13: 287.

Dinurothrips Hood, 1913e. Genotype: *Dinurothrips hookeri*.
hookeri, 1913e. Puerto Rico.

Dorcadothrips nevini, 1941a. No. Amer.

Dorythrips Hood, 1931a. Genotype: *Dorythrips chilensis*.
chilensis, 1931a. So. Amer.

Echinothrips subflavus, 1927b. No. Amer.

Enneothrips Hood, 1935c. Genotype: *Enneothrips gustaviae*.
gustaviae, 1935c. Panama.

Erythrothrips costalis, 1937g. So. Amer.
nigripennis, 1937e. So. Amer.
stygicus, 1938h. So. Amer.

Euceratothrips Hood, 1936f. Genotype: *Euceratothrips marginipennis*.
marginipennis, 1936f. So. Amer.

Eugeneothrips Hood, 1938a. Genotype: *Taeniothrips (Eugeneothrips) priesneri*.
priesneri, 1938a. Africa.

Fauriella Hood, 1937a. Genotype: *Fauriella natalensis*.
natalensis, 1937a. Africa.

Frankliniella achaeta, 1925d. No. Amer.
alonsoae, 1941b. So. Amer.
alticola, 1941b. So. Amer.
ameliae, 1925d. Panama.
annulipes, 1915a. Panama.
antennata, 1937c. So. Amer.

auripes, 1915a. So. Amer.
bagnalliana, 1925d. Panama.
bondari, 1941b. So. Amer.
borinquen, 1941b. Puerto Rico.
brevicaulis, 1937c. Panama.
castanea, 1941b. So. Amer.
citripes, 1916e. Cuba.
cognata, 1941b. So. Amer.
compositarum, 1941b. So. Amer.
cubensis, 1925d. Cuba.
curta, 1941b. Trinidad.
difficilis, 1925d. W. Indies.
diversa, 1935c. Panama.
exigua, 1925d. No. Amer.
extremitata, 1937c. So. Amer.
fuscicauda, 1927h. No. Amer.
genuina, 1925d. No. Amer.
gossypiana, 1936b. No. Amer. New name for *F. gossypii* (Morgan), 1913.
inca, 1941b. So. Amer.
maculipes, 1941b. So. Amer.
nigricauda, 1925c. Trinidad.
nubilicornis, 1941b. So. Amer.
panamensis, 1925d. Panama.
parvula, 1925c. Trinidad, Panama.
peruviana, 1937c. So. Amer.
phaeaner, 1941b. So. Amer.
pineticola, 1941b. Cuba.
pulchella, 1935c. Panama.
regalis, 1941b. So. Amer.
regia, 1941b. So. Amer.
regina, 1937e. So. Amer.
rex, 1941b. So. Amer.
solidaginis, 1941b. No. Amer.
standleyana, 1935c. Panama.
stylosa, 1912d. No. Amer.
sulfuripes, 1937c. Panama.
tridacana, 1937c. Panama.
trinidadensis, 1941b. Trinidad.
trisetosa, 1941b. So. Amer.
tritici var. *moultoni*, 1914f = *F. moultoni*. Moulton, 1935. Pan-Pacific Ent. 11 (4): 170 and Moulton, 1948.
tympanona, 1915a. So. Amer.
williamsi, 1915a. No. Amer.
xanthaner, 1941b. So. Amer.
xanthomelaena, 1937g. So. Amer.
zeteki, 1925d. Panama.

(For a review of *Frankliniella* see Moulton. 1948. Rev. de Ent. 19 (1-2): 55-114).

Franklinothrips tenuicornis, 1915d. Panama.

Halmathrips Hood, 1936e. Genotype: *Halmathrips citricinctus.*
citricinctus, 1936e. Trinidad.

Heliothrips cinctipennis, 1912d. No. Amer. = *Hercothrips* Hood, 1927i.
marginipennis, 1912d. No. Amer. = *Hercothrips.* ibid.
phaseoli, 1912e. No. Amer. = *Hercothrips.* ibid.
punctipennis, 1912d. No. Amer. = *Hercothrips.* ibid.
sculptilis, 1918c. Australia = *Hercothrips.* ibid.
striatus, 1913d. No. Amer. = *Hercothrips.* ibid.

Helionothrips crassus, 1937a. Africa.
stephaniae, 1937a. Africa.

Hercinothrips brunneus, 1940c. Africa.
dimidiatus, 1937a. Africa.

Hercothrips Hood, 1927i. Genotype: *Heliothrips striatus* Hood, 1913d.
funebris, 1927i. So. Amer.
helini, 1940c. Africa.
insularis, 1927i. W. Indies.
masculinus, 1927i. W. Indies.
nanus, 1927i. W. Indies.
williamsi, 1927i. W. Indies.

Heterothrips Hood, 1908a. (nec Buffa, 1908.) Bagnall, 1911. Ann. Soc. Ent. Belg. 54:461. Genotype: *Heterothrips arisaemae.* Moulton, 1932. Rev. de Ent. 2 (4): 466.
analis, 1915a. No. Amer.
arisaemae, 1908a. No. Amer.
azaleae, 1916e. No. Amer. = *aesculi* Wats. 1915. Watson, 1923, Univ. Fla., Agr. Exp. Sta. Bul. 168, p. 29.
borinquen, 1915a. Puerto Rico.
fimbriatus, 1934a. Panama.
flavicornis, 1915a. Panama.
flavicruris, 1934a. Panama.
lasquerellae, 1939b. No. Amer.
limbatus, 1925f. No. Amer.
lyoniae, 1916e. No. Amer.
minor, 1915a. Panama.
ornatus, 1938h. So. Amer.
pectinifer, 1915a. No. Amer.
peruvianus, 1936f. So. Amer.
pubescens, 1934a. Panama.
sericatus, 1913b. Puerto Rico.
vernus, 1939b. No. Amer.
vitis, 1916b. No. Amer. (nec. *H. arisaemae*, Morgan, 1913.)
xolismae, 1936c. No. Amer.

Isochaetothrips striatus, 1935c. Panama.

Leucothrips furcatus, 1931c. W. Indies.

Melanthrips faurei, 1937d. Africa.

Merothrips Hood, 1912d. Genotype: *M. morgani* Hood.
cognatus, 1925c. Trinidad.
fusciceps, Hood and Wms., 1915f. No. Amer.
genuinus, 1938f. No. Amer.

laevis, 1938f. No. Amer.
morgani, 1912d. No. Amer.
nigricornis, 1937e. So. Amer.
productus, 1938f. No. Amer.

Odontothrips pictipennis, 1916e. No. Amer.

Opisthothrips Hood, 1937a. Genotype: *Opisthothrips elytropappi*.
elytropappi, 1937a. Africa.

Organothrips Hood, 1940b. Genotype: *Organothrips bianchii*.
bianchii, 1940b. Terr. Hawaii.

Oxythrips coloradensis, 1937b. No. Amer.
divisus, 1916f. No. Amer. (Note: Genotype of *Oxythrips* Uzel, 1895, here designated by Hood as *Oxythrips ajugae* Uzel, 1895.)
pallidiventris, 1938i. No. Amer.
pinicola, 1937b. No. Amer.

Perissothrips Hood, 1919b. Genotype: *Perissothrips parviceps*.
parviceps, 1919b. India.

Phibalothrips Hood, 1918c. Genotype: *Phibalothrips exilis*.
exilis, 1918c. Australia.

Physothrips funestus, 1915a. No. Amer. (Note: Hood, 1925g, concluded that *Physothrips* Karny, 1912 was synonymous with *Oxythrips* Uzel, 1895 but did not transfer these five species to *Taeiothrips*. See also Treherne, 1923. 53rd. An. Rpt. Ent. Soc. Ont., p. 42 and, Steineweden, 1933. Trans. Amer. Ent. Soc. 59: 269.)
maculicollis, 1918c. Australia.
pictus, 1916e. Africa.
ventralis, 1918a. Africa.
xanthocerus, 1916c. Africa.

Plesiothrips Hood, 1915i. Genotype: *Sericothrips* ? *perplexus* Beach, 1896.
amblycauda, 1925c. Trinidad.
brunneus, 1936e. Panama.
octarthrus, 1925c. Trinidad.
typhae, 1940a. No. Amer.
veticalis, 1940a. So. Amer.
williamsi, 1940a. No. Amer.

Prosopothrips cognatus, 1914a. No. Amer.

Protemnothrips, 1937e. Genotype: *Heterothrips (Protemnothrips) miconiae*,
niconiae, 1937e. So. Amer.

Psectrothrips Hood, 1937e. Genotype: *Psectrothrips delostomae*.
delostomae, 1937e. So. Amer.

Pseudothrips spadix, 1916e. Panama.

Psilothrips Hood, 1927h. Genotype: *Psilothrips pardalotus*.
pardalotus, 1927h. No. Amer.

Pterothrips Hood, 1918c. Genotype: *Pterothrips quadratus*. = *Australothrips* Bagn., 1916. Bagnall, 1932. Ann. Mag. Nat. Hist. 10 (ser. 10) No. 59, p. 505.
quadratus, 1918c. Australia. = *Australothrips bicolor* Bagn., 1916.

Rhabdothrips Hood, 1933a. Genotype: *Rhabdothrips albus*.
albus, 1933a. Panama.

Rhipidothrips cinctus, 1918c. Australia.

Rhipiphorothrips cruentatus, 1919b. India.

Salpingothrips Hood, 1935c. Genotype: *Salpingothrips minimus*.
minimus, 1935c. Panama.

Scirtothrips australiae, 1919c. Australia.
brevipennis, 1914b. No. Amer.
dorsalis, 1919b. India.
niveus, 1913a. No. Amer.
panamensis, 1935c. Panama.
prosopis, 1939b. No. Amer.

Sericothrips annulipes, 1927b. No. Amer.
apicalis, 1927f. No. Amer.
baptisiae, 1916e. No. Amer.
basilaris, 1941a. Cuba.
beachae, 1927f. No. Amer.
burungae, 1935c. Panama.
campestris, 1939b. No. Amer.
chrysothamni, 1936c. No. Amer.
collaris, 1936c. No. Amer.
ctenogastris, 1936c. No. Amer.
fraxinicola, 1940a. No. Amer.
geminus, 1935c. Panama.
gracilipes, 1924a. No. Amer.
interruptus, 1927f. No. Amer.
inversus, 1927i. W. Indies.
nubilipennis, 1924c. No. Amer.
occipitalis, 1917a. Africa.
opuntiae, 1936c. No. Amer.
pedicellatus, 1927f. No. Amer.
pulchellus, 1908a. No. Amer.
sambuci, 1924c. No. Amer.
sensillis, 1936c. No. Amer.
setosus, 1927f. No. Amer.
spiritus, 1927f. No. Amer.
sternalis, 1935c. Panama.
tiliae, 1931c. No. Amer.
tricinctus, 1927i. W. Indies.
williamsi, 1927i. W. Indies.
zebra, 1940a. No. Amer.

Sericopsothrips Hood, 1936c. Genotype: *Sericopsothrips palloris*.
palloris, 1936c. No. Amer.

Stomatothrips Hood, 1912b. Genotype: *Stomatothrips flavus*.
atratus, 1939b. No. Amer.
flavus, 1912b. No. Amer.

Stomatothrips septenarius, 1925c. Trinidad.

Taeniothrips aethiops, 1925g. Africa.
debilis, 1925g. Africa.
dilutus, 1925g. Africa.
modestus, 1925g. Africa.

refescens, 1925g. Africa.
silvestris, 1935a. Panama.
vaccinophilus, 1936a. No. Amer.

Thrips aurantithoracis, 1932c. Africa.
aureus, 1915a. No. Amer.
exilicornis, 1932c. Africa.
hirtiventris, 1932c. Africa.
hispidipennis, 1932c. Africa.
impar, 1915a. No. Amer.
meliaefloris, 1932c. Africa.
monotropae, 1927b. No. Amer.
nubilans, 1941a. No. Amer.
pallicornis, 1912d. No. Amer.
pallidicollis, 1933b. No. Amer.
pectinatus, 1932b. No. Amer.
priesneri, 1932c. Africa.
quadrisetosus, 1932c. Africa.
sambucifloris, 1933b. No. Amer. = *T. madronii* Moulton. (The writer was informed of this synonymy March 22, 1947 in conversation with Mr. Moulton to whom it should be credited.)
sieversiae, 1933b. No. Amer.
spadix, 1932c. Africa.
spadix var. *brevipes*, 1932c. Africa.
thalictri, 1931c. No. Amer.
tripartitus, 1940a. No. Amer.

Thrips varipes, Hood, 1913a. No. Amer.
veratri, 1927b. No. Amer. = *Thrips herricki* Bagn. 1926. Hood, 1931b.
winnemanae, 1913a. No. Amer.

Tryphactothrips brevipilus, 1927i. Trinidad.
lineatus, 1927i. Trinidad.

LIST OF TUBULIFERA Described by J. Douglas Hood

Acanthothrips albivittatus, 1908a. No. Amer.
candidus, 1938e. So. Amer.

Actinothrips bondari, 1928f. So. Amer.
monochaetus, 1935f. British Guiana.
polychaetus, 1941a. So. Amer.
trichaetus, 1935f. Panama.

Adelothrips Hood, 1938f. Genotype: *Adelothrips xanthopus*.
conicura, 1941b. So. Amer.
macura, 1941a. Cuba.
pericles, 1938f. No. Amer.
phaeura, 1941a. No. Amer.
sculptilis, 1941b. So. Amer.
xanthopus, 1938f. No. Amer.

Adiaphorothrips amplus, 1925h. No. Amer. = *Sporothrips* Hood, 1938f.
girault, 1918c. Australia.

Adraneothrips Hood, 1925c. Genotype: *Haplothrips* (?) *tibialis* Hood, 1914e.

abdominalis, 1925c. W. Indies.
albicollis, 1935a. Panama.
alternatus, 1925c. Trinidad, Panama.
bilineatus, 1935a. Panama.
cinctiventris, 1941b. No. Amer.
decorus, 1938f. No. Amer.
diligens, 1935a. Panama.
fuscicollis, 1925c. W. Indies.
huachucae, 1927h. No. Amer.
imbecillus, 1938h. So. Amer.
inca, 1938h. So. Amer.
microsetis, 1941b. So. Amer.
oculatus, 1941b. So. Amer.
peruviensis, 1941b. So. Amer.
pinicola, 1938f. No. Amer.
poecilonotus, 1939b. No. Amer.
rostratus, 1938f. No. Amer.
simulator, 1925c. Trinidad.
stenocephalus, 1938f. No. Amer.
uniformis, 1925c. Trinidad.
xanthosoma, 1938f. No. Amer.

Allothrips Hood, 1908a. Genotype: *Allothrips megacephalus*. Designated by Faure, 1933. Bul. Brook. Ent. Soc. 28: 25.
megacephalus, 1908a. No. Amer.
watsoni, 1939b. No. Amer.

Anactinothrips brachyura, 1941b. So. Amer.
cristatus, 1936d. So. Amer.
graphidura, 1938h. So. Amer.
marginipennis, 1941b. So. Amer.
nigricornis, 1936d. So. Amer.
vigilans, 1938h. So. Amer.

Anchylothrips Hood, 1939b. Genotype: *Haplothrips (Anchylothrips) preeri*.
preeri, 1939b. No. Amer.

Arcyothrips Hood, 1934d. Genotype: *Arcyothrips africanus*.
africanus, 1934d. Africa.
floridanus, 1938f. No. Amer.

Arrhenothrips Hood, 1919b. Genotype: *Arrhenothrips ramakrishnae*. Doubtfully referred to *Mesothrips* by Kelly and Mayne, 1934, pp. 62-63.
ramakrishnae, 1919b. India.

Asemothrips Hood, 1919c. Genotype: *Asemothrips picturatus*.
picturatus, 1919c. Australia.

Atractothrips Hood, 1938b. Genotype: *Atractothrips bradleyi*.
bardleyi, 1938b. No. Amer.

Bagnalliella arizonae, 1927h. No. Amer.
australis, 1939b. No. Amer.
desertae, 1927h. No. Amer.
glaucae, 1927f. No. Amer.
huachucae, 1927h. No. Amer.
mojave, 1927h. No. Amer.

Barythrips Hood and Wms., 1915f. Genotype: *Barythrips sculpticauda.*
heterocerus, 1925c. W. Indies.
sculpticauda Hood and Wms., 1915f. No. Amer.

Bolothrips litoreus, 1939b. No. Amer.

Botanothrips Hood, 1939b. Genotype: *Bolothrips (Botanothrips) pratensis.*
pratensis, 1939b. No. Amer.

Bradythrips Hood and Wms., 1925c. Genotype: *Bradythrips hesperus.*
hesperus, Hood and Wms., 1925c. Br. Guiana.

Cephalothrips hexperus, 1941a. No. Amer.

Cercothrips Hood, 1919a. Genotype: *Acanthinothrips nigrodentatus* Karny.

Ceuthothrips Hood, 1938f. Genotype: *Ceuthothrips timupua.*
timupa, 1938f. No. Amer.

Compsothrips recticeps, 1924d. Africa = *Oedaleothrips*, Hood, 1936e.

Cordylothrips Hood, 1937g. Genotype: *Cordylothrips peruvianus.*
peruvianus, 1927g. So. Amer.

Cryptothrips acanthus, 1919c. Australia. (*Cryptothrips latus* Uzel, 1895, designated by Hood, 1916e, as genotype of *Cryptothrips*).
acuticornis, 1925c. W. Indies = *Gastrothrips*. Hood, 1935b.
badius, 1918c. Australia = *Bolothrips*. Hood, 1939b.
(?) *breviventris*, 1927b. No. Amer.
carbonarius, 1908a. No. Amer.
claripennis, 1919c. Australia.
connaticornis, 1925c. Trinidad.
dimidiatus, 1918c. Australia = *Bolothrips* Pr., 1926. Hood, 1939b.
dolichos, 1918c. Australia.
exiguus, 1912d. No. Amer.
gilvipes, 1914. No. Amer. = *Bolothrips* Pr., 1926. Treubia 8: 90-93. Hood, 1939b. (See also Hood, 1935b. p. 178.)
gradatus, 1925c. W. Indies.
junctus, 1912c. No. Amer.
laticeps, 1918c. Australia.
longiceps, 1912d. No. Amer.
rectangularis, 1908b. No. Amer.
sordidatus, 1927h. No. Amer.

Dasythrips Hood, 1937g. Genotype: *Dasythrips regalis.*
fraterculus, 1941a. So. Amer.
regalis, 1937e. So. Amer.

Diceratothrips cubensis, 1941a. Cuba.
delicatus, 1941a. No. Amer.
harti, 1912a. No. Amer.

Diceratothrips longipes, 1912a. No. Amer.
obscuricornis, 1941a. Cuba.
picticornis, 1914g. Panama.
princeps, 1934a. Panama.
setigenis, 1941a. No. Amer.

Dichaetothrips Hood, 1914g. Genotype: *Dichaetothrips brevicollis.*
brevicollis, 1914g. British Guiana.
neivai, 1940a. Cuba.

Diopsothrips Hood, 1933e. Genotype: *Diopsothrips flavus.*
brunneus, 1933e. Panama.
flavus, 1933e. Panama.
louisianae, 1936c. No. Amer.

Diplacothrips Hood, 1937g. Genotype: *Diplacothrips borgmeieri.*
borgmeieri, 1937g. So. Amer.

Ecacanthothrips priesneri, 1935e. Africa.

Elaphrothrips acanthomerus, 1941a. So. Amer.
aztecus, 1941a. No. Amer.
blatchleyi, 1938f. No. Amer.
dampfi, 1940d. No. Amer.
defectus, 1941a. So. Amer.
indagator, 1936f. So. Amer.
parallelus, 1924c. No. Amer.
peruviensis, 1936f. So. Amer.
prospector, 1936f. So. Amer.
vittipennis, 1940a. No. Amer.
zetetis, 1936f. So. Amer.

Eothrips Hood, 1915e. Genotype: *Dolerothrips crassicornis* Karny, 1912.

Euoplothrips Hood, 1918c. Genotype: *Euoplothrips bagnalli.*
bagnalli, 1918c. Australia.
carcinoides, 1937h. Solomon Is.

Eupathithrips panscopus, 1938h. So. Amer.
spectator, 1934a. Panama.

Eurythrips amplus, 1934b. Trinidad.
cinctus, 1927i. Trinidad.
citricollis, 1941a. No. Amer.
claviger, 1941a. No. Amer.
collaris, 1925c. Trinidad.
conjunctus, 1934a. Panama.
connatus, 1938f. No. Amer.
disjunctus, 1941a. No. Amer.
dissimilis, 1938i. No. Amer.
forticornis, 1939b. No. Amer.
gracilicornis, 1925c. Trinidad = *Terthrothrips*, Hood, 1935b.
harti, 1925e. No. Amer.
hookae, 1933e. Panama.
macrops, 1925h. No. Amer.
pettiti, 1941a. No. Amer.
sculpturus, 1936a. No. Amer.
silvarum, 1941a. No. Amer.
tarsalis, 1925h. No. Amer.
tristis, 1941a. No. Amer.
umbrisetis, 1933e. Panama.
watsoni, 1941a. No. Amer.

Exophthalmothrips moultoni, 1941b. So. Amer.

Gastrothrips Hood, 1912d. Genotype: *Gastrothrips ruficauda.*
abditus, 1935f. Panama.
alticola, 1941b. So. Amer.

callipus, 1935b. No. Amer.
capitalis, 1935b. No. Amer.
dominicanus, 1935b. W. Indies.
fulvicauda, 1937e. So. Amer.
fulviceps, 1937e. So. Amer.
intonsus, 1941a. So. Amer.
monticola, 1941b. So. Amer.
nigrisetis, 1935b. Panama.
parvidens, 1935b. Panama.
picticornis, 1936e. So. Amer.
proteus, 1933e. Panama = *G. anolis* Morgan, 1925. Hood, 1933e, 1935b.
ruficauda, 1912d. No. Amer.
stygicus, 1935b. Panama.
texanus, 1912d. No. Amer.
trinidadensis, 1935b. Trinidad.
validipennis, 1938f. No. Amer.

Gigantothrips crawfordi, 1919a. Phillipine Is.

Glyptothrips Hood, 1912e. Genotype: *Glyptothrips flavescens.*
flavescens, 1912e. No. Amer. (Erroneously placed in *Pactothrips* originally—see Hood, 1912e, and 1912g).

Gnophothrips Hood and Wms., 1915f. Genotype: *Gnophothrips megaceps.*
megaceps, Hood and Wms., 1915f. No. Amer.

Goniothrips Hood, 1927h. Genotype: *Goniothrips denticornis.*
denticornis, 1927h. No. Amer.

Gynaikothrips (?) *sulcifrons*, 1936e. Panama.

Haplothrips anceps, 1918c. Australia.
angustus, 1919c. Australia.
(?) *bellus*, Hood and Wms., 1915f. No. Amer. = *Adraneothrips* Hood, 1925c.
distalis, 1925e. No. Amer.
faurei, 1914g. No. Amer.
froggatti, 1918c. Australia.
graminis, 1912b. No. Amer.
halophilus, 1915a. No. Amer.
humilis, 1914g. Panama.
malifloris, 1916e. No. Amer.
nubilipennis, 1914g. No. Amer.
purpuratus, 1925e. No. Amer.
rectipennis, 1927e. No. Amer.
(?) *tibialis*, 1914e. Puerto Rico = *Adraneothrips* Hood, 1925c.
varius, 1918c. Australia.
xanthocrepis, 1940a. No. Amer.

Hindsiana dodgei, 1925b. No. Amer. = *Karnyothrips* Hood, 1927d.
pullata, 1925b. No. Amer.
rhopalocera, 1925c. W. Indies = *Karnyothrips* Hood, 1927d.

Holopothrips Hood, 1914f. Genotype: *Holopothrips signatus.*
anacardii, 1941b. So. Amer.
hambletoni, 1938h. So. Amer.

hilaris, 1938h. So. Amer.
orites, 1941b. So. Amer.
permagnus, 1948h. So. Amer.
pictus, 1941b. So. Amer.
signatus, 1914f. Panama.

Holopothrips tenuis, 1914f. Panama.

Hoplandrothrips Hood, 1912d. Subgenus of *Phlaeothrips* Hal. Genotype: *Phlaeothrips (Hoplandrothrips) xanthopus.*
affinis, 1915h. British Guiana.
angustatus, 1927h. No. Amer.
caudatus, 1938k. So. Amer.
costano, 1941b. No. Amer.
cubicola, 1941b. Cuba.
funebris, 1912b. No. Amer.
gynandrus, 1927b. No. Amer.
insolens, 1912d. No. Amer. = *Phloeobiothrips* Hood. 1925f.
juniperinus, 1912d. No. Amer.
lissonotus, 1941b. No. Amer.
mcateei, 1915a. No. Amer.
microps, 1912d. No. Amer.
nigricestus, 1933e. Panama.
pallens, 1941b. Cuba.
proximus, 1927b. No. Amer.
russelli, 1915a. No. Amer.
salicacearum, 1941b. No. Amer.
scutellaris, 1941b. No. Amer.
symmetricus, 1941b. Host and locality unknown.
virago, 1931c. No. Amer.
xanthopus, 1912d. No. Amer.

Hoplothrips aciculatus, 1941a. No. Amer.
argus, 1939b. No. Amer.
delicatulus, 1939b. No. Amer.
oriochares, 1941b. So. Amer.
rufescens, 1941b. Panama.
tejas, 1939b. No. Amer.

Hyidiothrips Hood, 1948f. Genotype: *Hyidiothrips atomarius.*
atomarius, 1948f. No. Amer. For this species Hood established a new subfamily, *Hyidiothripinae*, which is an anomalous group.

Idolothrips armatus, 1908c. No. Amer. = *Elaphrothrips.* Hood, 1927b. Andre. 1940.
flavipes, 1908a. No. Amer. = *Elaphrothrips*, Hood, 1927b. Made the genotype of *Elaphrothrips* (Hood, 1940d.) but preceded by Andre (1940) who established *I. coniferarum* Perg., 1896. Andre in letter, Dec. 9, 1947 confirms his priority.
tuberculatus, 1908c. No. Amer. = *Elaphrothrips*, Hood, 1927d.

Karnyothrips antennatus, 1938h. Trinidad.
arenicola, 1938j. No. Amer. = *Watsoniella.* Hood, 1939b, p. 579.
arizona, 1938j. No. Amer.
brimleyi, 1948i. No. Amer. = *Watsoniella*, Hood, 1940a, p. 571.

caliginosus, 1938h. So. Amer.
caxamarca, 1938h. So. Amer.
ochropezus, 1934a. Panama.

Kleothrips acanthus, 1918b. Australia. Kelly and Mayne. 1934, p. 70. Sydney.
atratus, 1919a. Africa.

Lathrobiothrips Hood, 1933e. Genotype: *Lathrobiothrips ramuli.*
insignis, 1938e. So. Amer.
ramuli, 1933e. Panama. (See also Hood, 1938e.)
woytkowskii, 1941b. So. Amer.

Leeuwenia convergens, 1918c. Australia = *Hoodiella*, Kelly and Mayne, 1934. Sydney.

Leptothrips Hood, 1909c. Genotype: *Cryptothrips aspersus* Hinds, 1902 = *Leptothrips mali* (Fitch), 1855. "Neotypes" designated by Hood, 1914g.
acaciae, 1938j. No. Amer.
heliomanes, 1927h. No. Amer.
larreae, 1938j. No. Amer.
oregonensis, 1938j. No. Amer.
oribates, 1938j. No. Amer.
papago, 1938j. No. Amer.
singularis, 1941a. No. Amer.
vittipennis, 1938. Panama.

Liothrips araliae, 1935a. Panama.
avocadis, 1935a. Panama.
badius, 1925a. Africa.
barronis, 1936e. Panama.
bispinosus, 1938k. Panama.
brevicornis, 1913a. No. Amer.
brevidens, 1918c. Australia = *Teuchothrips*. Hood, 1919c.
castaneae, 1915j. No. Amer.
connatus, 1918c. Australia = *Teuchothrips*. Hood, 1919c.
cordiae, 1935a. Panama.
disjunctus, 1918c. Australia = *Teuchothrips*. Hood, 1919c.
epimeralis, 1938k. So. Amer.
genualis, 1925a. Africa.
gracilior, 1918c. Australia = *Teuchothrips*. Hood, 1919c.
leucogonis, 1915j. No. Amer.
montanus, 1913a. No. Amer.
ocellatus, 1908a. No. Amer. (See also Hood, 1909a, 1909c, and 1931c.)
ordinarius, 1919b. India = *Eurhynchothrips*. Karny, 1926. Mem. Dept. Agr. India., Ent. Ser., 9 (6): 210.
penetralis, 1935a. Panama.
sambuci, 1913a. No. Amer.
tenuis, 1918c. Australia.
tessariae, 1915a. So. Amer.
tupac, 1938k. So. Amer.
umbratus, 1918c. Australia = *Gynaikothrips*. Karny, 1928. Treubia (10)1: 39.

varicornis, 1912b. No. Amer.
vigilax, 1938k. So. Amer.
xanthocerus, 1927h. No. Amer.
zeteki, 1913c. Panama.

Lissothrips Hood, 1908a. Genotype: *Lissothrips muscorum*. Up to this time not designated.
breviceps, 1925c. Trinidad.
claripes, 1940a. No. Amer.
muscorum, 1908a. No. Amer.
ocellatus, 1939b. No. Amer.
pallipes, 1925c. Trinidad.

Macrophthalmothrips exilicornis, 1941b. Trinidad.
femoralis, 1941b. So. Amer.
helenae, 1934a. Panama.
narcissus, 1934a. Panama.
pulchellus, 1934c. Africa.
williamsi, 1925c. Trinidad.

Malacothrips adranes, 1938f. No. Amer.
roycei, 1941a. No. Amer.

Megalothrips picticornis, 1927h. No. Amer.
spinosus, 1908b. No. Amer.

Mesothrips australiae, 1918c. Australia.

Metriothrips Hood, 1936e. Genotype: *Metriothrips midas*.
midas, 1936e. Panama.

Neoheegeria indica, 1919b. India = *Dolichothrips*. (This new synonymy is to be credited to Priesner who informed me of this in correspondence, Feb. 18, 1939.)

Neosmerinthothrips (?) *debilis*, 1936e. Panama.

Neothrips Hood, 1908a. Genotype: *Neothrips corticis*. Not designated up to this time.
corticis, 1908a. No. Amer.

Neurothrips Hood, 1924c. Genotype: *Acanthothrips magnafemoralis* Hinds, 1902. (See also Hood, 1938e.)
allopterus, 1938e. So. Amer.
williamsi, 1925c. Panama. See also Hood, 1938e.

Notothrips Hood, 1933d. Genotype: *Phlaeothrips vittatus* Hood, 1912a.
folsomi, 1933d. No. Amer.

Oedaleothrips Hood, 1916f. Genotype: *Oeadaleothrips hookeri*.
aeneus, 1937e. So. Amer.
baileyi, 1941a. No. Amer.
bradleyi, 1937f. No. Amer.
brunneus, 1941a. No. Amer.
campestris, 1941a. No. Amer.
graminis, 1936a. W. Indies.
hookeri, 1916f. No. Amer.
jacksoni, 1925e. No. Amer.

Ommatothrips Hood, 1915a. Genotype: *Ommatothrips gossypii* Hood.
gossypii, 1915a. So. Amer.

Ophthalmothrips Hood, 1919a. Genotype: *Ophthalmothrips pomeroyi. pomeroyi*, 1919a. Africa.

Orthothrips woytkowskii, 1938k. So. Amer.

Pactothrips Hood, 1912e. = *Glyptothrips.* Hood. 1914g.

Parallothrips Hood, 1939b. Genotype: *Parallothrips thomasi. thomasi*, 1939b. No. Amer.

Pathothrips, 1937g. Genotype: *Hoplandrothrips (Pathothrips) proteus. proteus*, 1937g. So. Amer.

Phlaeothrips chapmani, 1927b. No. Amer.
forbesi, 1940a. No. Amer.
maculatus, 1909c = *Stictothrips.* Hood, 1924d.
ornatus, 1913a. No. Amer. = *Poecilothrips.* Hood, 1927b.
poecilus, 1935e. Africa.
vittatus, 1912a. No. Amer. = *Notothrips.* Hood, 1933d.

Phaulothrips Hood, 1918c. Genotype: *Phaulothrips vuilleti. vuilleti*, 1918c. Australia.

Phloeobiothrips Hood, 1925f. Genotype: *Phloeobiothrips tumiceps. tumiceps*, 1925f. Australia.

Phthirothrips morgani, 1941a. No. Amer.

Phyllothrips Hood, 1908b. Genotype: *Phyllothrips citricornis* = *Liothrips.* Bagnall, 1911. Ann. Soc. Ent. Belg. 54: 461.
citricornis, 1908b. No. Amer. = *Liothrips.* Hood, 1918c. (See also Hood, 1909c.)
umbripennis, 1909a. No. Amer. = *Liothrips.* Hood, 1918c. (See also Hood, 1909c.)

Plectrothrips Hood, 1908a. Genotype: *Plectrothrips antennatus.* Designated by Moulton. 1933. Rev. de Ent. 3 (3): 285.
antennatus, 1908a. No. Amer.
atactus, 1924d. Africa.
impatiens, 1925c. Trinidad.
latus, 1941a. Panama.
longisetis, 1941a. No. Amer.
pallipes, 1916g. W. Indies.

Podothrips Hood, 1913b. Genotype: *Podothrips semiflavus.*
denticeps, 1916a. Africa.
semiflavus, 1931b. Puerto Rico.
xanthopus, 1919c. Australia.

Polyommatothrips vigilans, 1913c. Panama = *Sedulothrips.* Hood, 1938k.

Polyphemothrips corticis, 1914g. Panama.
cuneatus, 1939c. So. Amer.
minor, 1937g. So. Amer.
tenuiceps, 1937e. So. Amer.
tibialis Hood and Wms., 1915f. No. Amer.
woytkowskii, 1937e. So. Amer.
yupanqui, 1937g. So. Amer.

Preeriella Hood, 1939b. Genotype: *Chirothripoides minutus* Watson, 1927.

Priesneriella Hood, 1927h. Genotype: *Priesneriella citricauda. citricauda*, 1927h. No. Amer.

Pristothrips Hood, 1925c. Genotype: *Pristothrips aaptus.*
aaptus, 1925c. Trinidad. (See also Hood, 1938e.)
albipunctatus, 1925c. Trinidad.
peruviensis, 1938e. So. Amer.

Pselaphothrips Hood, 1916a. Genotype: *Pselaphothrips pomeroyi.*
pomeroyi, 1916a. Africa.

Pygidiothrips Hood, 1938f. Genotype: *Pygidiothrips seminole.*
seminole, 1938f. No. Amer.

Pygothrips Hood, 1915b. Genotype: *Pygothrips rugicauda.*
albiceps, 1938f. No. Amer.
breviceps, 1933e. Panama.
conifer, 1925c. Trinidad.
fortis, 1938f. No. Amer.
needhami, 1938f. No. Amer.
nigricauda, 1925c. Trinidad.
Pygothrips rugicauda, 1915b. Australia. The family Pygothripidae was established by Hood at this time.
zeteki, 1933e. Panama.

Rhopalothrips Hood, 1912b. Genotype: *Rhopalothrips bicolor.*
bicolor, 1912b. No. Amer.

Rhynchothrips Hood, 1912d. Genotype: *R. pruni.*
debilis, 1925h. No. Amer.
dentifer, 1912d. No. Amer.
piger, 1925e. No. Amer.
pruni, 1912d. No. Amer.
rostratus, 1927h. No. Amer.
russelli, 1925b. No. Amer.
(?) *salicarius*, 1913a. No. Amer.
soror, 1918c. Australia.
usitatus, 1927e. No. Amer.

Scopaeothrips Hood, 1912b. Genotype: *Scopaeothrips unicolor.*
unicolor, 1912b. No. Amer.

Sedulothrips quichua, 1938k. So. Amer.
tristis, 1933e. Panama.

Sophiothrips Hood, 1933e. Genotype: *Sophiothrips squamosus.*
panamensis, 1933e. Panama.
squamosus, 1933e. Panama.
unicolor, 1939b. No. Amer.

Sporothrips Hood, 1938f. Genotype: *Adiaphorothrips amplus* Hood, 1925h.

Stegothrips Hood, 1934d. Genotype = *Stegothrips barronis.*
barronis, 1934d. Panama.

Stephanothrips bradleyi, 1927h. No. Amer.
carolina, 1938i. No. Amer.
occidentalis, Hood and Wms., 1935c. Trinidad.

Stictothrips Hood, 1924d. Genotype: *Phloeothrips maculatus* Hood, 1909c.
faurei, 1924d. Africa.

Strepterothrips Hood. 1933e. Genotype = *Strepterothrips conradi.*
conradi, 1933e. Panama.

Symphyothrips Hood and Wms., 1915f. Genotype: *Symphyothrips punctatus.*
punctatus, Hood and Wms., 1915f. No. Amer.

Syncerothrips Hood, 1935b. Genotype: *Syncerothrips harti.*
harti, 1935b. No. Amer.

Terthrothrips clavivestis, 1935f. Panama. (Genotype of *Terthrothrips* here designated as *Phlaeothrips sanguinolentus* Bergroth, 1896 by Hood.)

Teuchothrips Hood, 1919c. Genotype: *Teuchothrips simplicipennis.*
badiipennis, 1919c. Australia.
pithecolobii, 1940e. No. Amer.
simplicipennis, 1919c. Australia.

Trachythrips Hood, 1929. Genotype = *Trachythrips watsoni.*
albipes, 1933c. Panama.
brevis, 1939b. No. Amer.
deleoni 1933c. Panama.
epimeralis, 1941a. So. Amer.
frontalis, 1933c. Panama.
gracilis, 1939b. No. Amer.
seminole, 1939b. No. Amer. (New name for *T. watsoni* Hood, var. *fairchildi* Watson, 1937.)
watsoni, 1929. No. Amer.

Trichinothrips panamensis, 1935a. Panama.

Trichothrips americanus, 1908a. No. Amer. = *Karnyothrips.* Hood, 1938c.
ampliceps, 1938f. No. Amer. = *Hoplothrips.* Hood, 1939b.
angusticeps, 1908a. No. Amer.
anomocerus, 1912c. No. Amer.
buffae, 1908a. No. Amer. = *Rhynchothrips.* Hood, 1912d.
calcaratus, 1925c. Trinidad.
connexus, 1919c. Australia.
flumenellus, 1931c. No. Amer. = *Hoplothrips.* Hood, 1939b.
fumiceps, 1925b. No. Amer.
fuscicornis, 1916e. No. Amer. = *Hoplothrips.* Hood, 1941b. p. 578.
graminis, 1933e. Panama = *Hoplothrips.* Hood, 1939b.
karnyi, 1914b. No. Amer. = *Hoplothrips.* Hood, 1938c. 1939b. J. C. Crawford, 1939b.
karnyi major, 1914e. No. Amer. = *Hoplothrips flavipes* (Bagn.), 1910. Hood, 1915e. 1927b. 1939b.
leibyi, 1938f. No. Amer.
longitubus, 1908a. No. Amer.
marginalis, Hood and Wms., 1915f. No. Amer.
mediamericanus, 1933e. Panama = *Hoplothrips.* Hood, 1939b.
militaris, 1933e. Panama.
moultoni, 1934a. Panama.
occipitalis, 1933e. Panama.
orbiceps, 1933e. Panama.
pergandei, 1927e. No. Amer.
rubicundulus, 1938f. No. Amer.
sculpticollis, 1938f. No. Amer.

smithi, 1909a. No. Amer.
terminalis, Hood and Wms., 1915f. No. Amer.
transvaalensis, 1924d. Africa.
tyrannus, 1933e. Panama.
xanthocephalus, 1936c. No. Amer.
zonatus, 1914g. Panama.

Tylothrips Hood, 1937g. Genotype: *Tylothrips concolor.*
concolor, 1937g. So. Amer.

Watsoniella anthracina, 1939b. No. Amer.
dimidiata, 1939b. No. Amer.
festiva, 1939b. No. Amer.
noveboracensis, 1940a. No. Amer.
texensis, 1940a. No. Amer.

Williamsiella Hood, 1925c. Genotype: *Williamsiella bicoloripes.*
bicoloripes, 1925c. Trinidad.

Zactinothrips Hood, 1936f. Genotype: *Zactinothrips elegans.*
elegans, 1936f. So. Amer.
modestus, 1941a. So. Amer.

Zaliothrips Hood, 1938f. Genotype: *Zaliothrips citripes.*
citripes, 1938f. No. Amer.
nigripes, 1938k. So. Amer.

Zeuglothrips Hood, 1936f. Genotype: *Zeuglothrips echinus.*
echinus, 1936f. So. Amer.

Zeugmatothrips annulipes, 1941a. So. Amer.
badiicornis, 1936f. So. Amer.
badiipes, 1937e. So. Amer.
bispinosus, 1937g. So. Amer.
priesneri, 1935a. Panama.

Zygothrips americanus, 1912e. No. Amer. = *Karnyothrips.* Hood, 1938c. (= *Xylaplothrips*, Priesner, 1939.)
bicolor, Hood and Wms., 1915f. No. Amer. = *Haplothrips (Hindsiana) melaleucus* (Bagn., 1911). Priesner, 1928. Thys. Europas, p. 624.
cingulatus, 1919c. Australia.
harti, 1913a. No. Amer. = *Watsoniella*, Hood, 1940a. (= *Xylaplothrips*, Priesner, 1939.)
inermis, 1919c. Australia.
longiceps, 1908a. No. Amer. = *Karnyothrips.* Hood, 1938h and 1938j.
pallescens, 1919c. Australia.
pallidus, 1912d. No. Amer. = *Karnyothrips* Hood, 1938j. (Also see Hood, 1939b, p. 579; *Watsoniella pallida.*)
pullus Hood and Wms., 1915f. No. Amer. = *Cephalothrips errans* Moulton, 1911. Hood, 1927d. Priesner, 1939. Proc. Roy. Ent. Soc. London, Ser. B, 8 (part 4): 74.
speciosus, 1925c. W. Indies.

FIVE NEW MITES FROM RATS IN PUERTO RICO

By IRVING FOX
School of Tropical Medicine, San Juan, Puerto Rico

The new mites described below were found associated with rats in the course of an ectoparasite survey now in progress at San Juan, Puerto Rico. Types of these new species are in the entomological collection of the School of Tropical Medicine.

FAMILY NEOPARASITIDAE

Gamasiphis illotus, n. sp.

(Fig. 1)

FEMALE.—Body glabrous, about .47 mm. long and about .33 mm. wide. Mouthparts not suitable for description. Jugular plates convex, not definite in form. Sternal plate typical of the genus. Genital plate reaching to below the middle of coxa III, provided with a pair of oval lighter depressions which are closer to the posterior border than to the anterior. Between the genital plate and the anal pore are about 8 small setae. Anal pore small, shield-shaped, its paired setae almost minute. Stigma distant from the body margin; peritreme long extending beyond coxa I. For further details of the ventral plates see Fig. 1. Dorsal plate glabrous.

TYPE MATERIAL.—Female holotype from *Rattus norvegicus* collected at San Juan (Santurce), Puerto Rico during 1947.

REMARKS.—Similar to *G. uncifer* Träg., this species differs from it in being smaller in size and in the possession of a smaller genital plate.

FAMILY PARASITIDAE

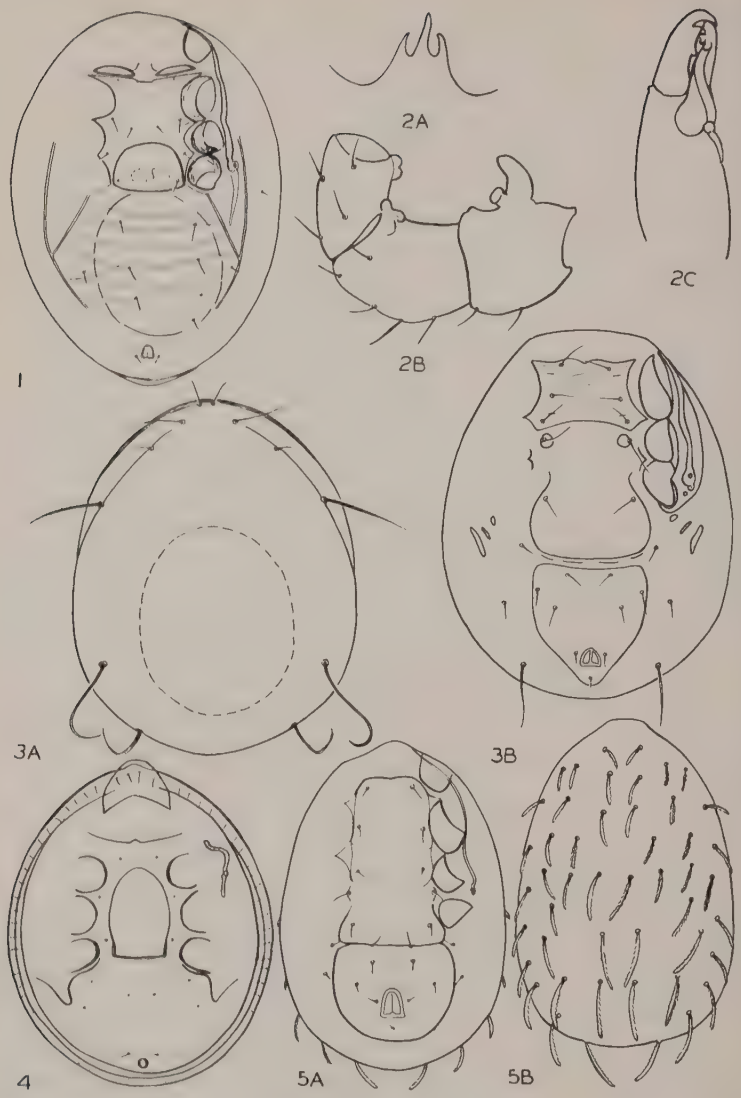
Parasitus digitus, n. sp.

(Fig. 2)

MALE.—Body provided with thin setae and fewer much larger ones, about .69 mm. long (exclusive of capitulum) and about .46 mm. wide. Epistome three-pronged, shaped as shown in Fig. 2A. Chilicera (Fig. 2C) large, toothed, the fixed arm slightly larger than the movable one. Genital pore with prominent wide borders. Intercoxal area with two rows of bristles consisting of four each. Dorsal plate not divided but with a distinct transverse suture on a level with the middle of coxa IV, well provided with narrow setae, the anterior portion in addition with about eight very large ones. Leg II with processes on the femur, genu and tibia as shown in Fig. 2B. Peritreme long and narrow extending to slightly beyond the middle of coxa I.

TYPE MATERIAL.—Male holotype and male paratype from *Rattus norvegicus* at San Juan (Santurce), Puerto Rico, the former collected October 7, 1947 and the latter August 6, 1947.

REMARKS.—In the structure of the male femoral process this species resembles *P. fucicola* Träg., but it differs in the shape of the epistome and details of the dorsal plate.



EXPLANATION OF PLATE

Fig. 1. *Gamasiphis illotus*, n. sp., female, ventral plates.

Fig. 2. *Parasitus digitus*, n. sp., male. 2A. Epistome.
2B. Processes on femur, genu and tibia.
2C. Chelicera.

Fig. 3. *Borinquolaelaps sexsetosus*, n. sp., female.
3A. Dorsal plate. 3B. Ventral plates.

Fig. 4. *Uropoda exigua*, n. sp., female, ventral plates.

Fig. 5. *Borinquolaelaps pennatus*, n. sp., female. 5A. Ventral plates.
5B. Dorsal plate.

FAMILY LAELAPTIDAE

Borinquolaelaps sexsetosus, n. sp.

(Fig. 3)

FEMALE.—Body broadly oval about .46 mm. long and about .26 mm. wide. Sternal plate (Fig. 3B) wider than long, sculptured, its setae long. Metasternal plates large and round, their setae on the lateral edges. Endopodal plates weak. Genital plate rounded posteriorly, its setae weak, separated from the ventro-anal plate. Ventro-anal plate large, shield-shaped with six setae in addition to those of the anal pore. Anal pore broadly triangular. Lateral to the ventro-anal plate on each side is a large and prominent bristle. Parapodal plate large. Stigma distant from the lateral border of the body, the peritreme short not extending beyond coxa II. Dorsal plate occupying most of the dorsal surface with a heavily sclerotized anterior edge, armed with six long robust bristles and several pairs of setae. For further details see Fig. 3A.

TYPE MATERIAL.—Female holotype from *Rattus norvegicus* collected at San Juan (Santurce), Puerto Rico, September 17, 1946.

REMARKS.—This new species is similar to *B. coronatus* Fox from which it differs particularly in the chaetotaxy of the dorsal plate. Both of these species, while congeneric with each other, differ so much from the genotype, particularly in the ventral plates, that they are very likely representatives of another genus. Efforts have been unsuccessful to fit them in any of the many described genera of the family and it is not deemed desirable at this time to erect a new generic name for them, hence they are permitted, for the present, to remain in the complex *Borinquolaelaps*.

Borinquolaelaps pennatus, n. sp.

(Fig. 5)

FEMALE.—Body well provided with long plumose setae, about .32 mm. long (exclusive of capitulum) and about .22 mm. wide. Sternal plate lightly sclerotized, its exact structure difficult to make out, the setae very weak. Metasternal and endopodal plates very weakly sclerotized. Genital plate broad, contiguous to the ventro-anal. Ventro-anal plate rounded posteriorly, provided with six setae in addition to those of the anal pore. Stigma distant from the lateral border of the body, peritreme long and narrow. For further details of the ventral plates see Fig. 5A. Dorsal plate (Fig. 5B) occupying the dorsal body surface, conspicuously provided with many long plumose setae.

TYPE MATERIAL.—Female holotype and female paratype from *Rattus norvegicus* collected at San Juan (Santurce), Puerto Rico, the former November 22, 1946 and the latter May 18, 1948.

REMARKS.—This new species is similar to *B. dentatus* Fox differing particularly in that the dorsal setae are much larger and more plumose and in the shape of the ventro-anal plate.

FAMILY UROPODIDAE

Uropoda exigua, n. sp.

(Fig. 4)

FEMALE.—Body smooth, not well provided with setae, about .37 mm. long and about .27 mm. wide. Tectum with a broad flap-like process extending beyond the anterior border of the body. Movable arm of the chelicera with a large tooth distally. Genital plate distant from the edge of the sternum, anteriorly on a level with the middle of coxa II, posteriorly reaching beyond the middle of coxa IV. Setae of the intercoxal area not discernible. Stigma small, peritremes short gracefully curved. Anal pore small, rounded, inconspicuous. For further details of the ventral aspect see Fig. 4. Dorsal plate glabrous. Marginal plate with weak equidistant setae.

TYPE MATERIAL.—Female holotype from *Rattus norvegicus* collected at San Juan (Santurce), Puerto Rico during 1947.

REMARKS.—The small size and the shape of the genital plate will distinguish this species from others in its genus.

REPORT OF THE THIRTY-FIRST ANNUAL MEETING OF THE FLORIDA ENTOMOLOGICAL SOCIETY

The thirty-first annual meeting of the Florida Entomological Society was held in Orlando at the San Juan Hotel on December 1 and 2, 1948. Registration of those attending the meetings began at 9:00 A. M. and continued until 10:30 A. M., at which time the president of the society, Dr. E. G. Kelsheimer, called the meeting to order.

President Kelsheimer opened the Wednesday morning session by first appointing an auditing committee composed of Dr. D. O. Wolfenbarger, Dr. I. J. Cantrall, and Mr. S. B. Hopkins. He then requested the vice-president, Mr. M. C. Van Horn, to take the chair. Mr. Van Horn introduced the first speaker of the day, Dr. Kelsheimer, who gave as his presidential address, a paper entitled "A New Page in Insecticide Production for the Protection of Vegetable Crops." Upon completion of his talk, Dr. Kelsheimer resumed the chairmanship of the meeting and presided during the presentation of the remainder of the papers given in the morning session. Just prior to adjournment of the morning session, the president requested each person to rise and introduce himself. The morning session was then adjourned.

The afternoon meeting commenced at 1:30 P. M. This session consisted chiefly of a discussion of the results of the work of the U. S. D. A. laboratory at Orlando in testing insecticides

against insects of medical importance. Studies of biting insect problems in the arctic were also discussed. The Wednesday afternoon session adjourned at 4:45 P. M.

This year, the society departed from the tradition of an annual banquet and substituted in its place an informal gathering in the meeting room of the San Juan Hotel. Dr. W. E. Dove gave a most challenging talk, "Some Fields Neglected by Entomologists," to the members and guests of the society. Refreshments were served by the local arrangements committee.

The Thursday morning session of the two day meeting was called to order by President Kelsheimer at 9:00 A. M. and those papers scheduled for Thursday morning were presented. This portion of the program was devoted to a discussion of citrus insects. It was found that the papers did not require the time allotted and that there would be an adequate period available for the business meeting. Dr. Kelsheimer therefore asked that the business meeting be moved from the Thursday afternoon portion of the program to the morning session. This suggestion met with the approval of the society, and the business meeting was called to order at 11:10 A. M.

As a first order of business, it was proposed that the membership committee submit its recommendations so that the persons who were elected to associate membership during the 1947 meeting might be raised to full membership and thus be eligible to hold office in the society. The chairman of the membership committee presented the following named persons for the respective memberships listed below:

Active membership: P. S. Arey, W. J. Decker, Fred Dexheimer, J. J. Diem, Kelvin Dorward, P. E. Frierson, L. A. Hetrick, D. W. Hookom, S. B. Hopkins, Jr., J. R. King, F. P. Lawrence, J. D. Rebstock, Ed. Seabrook, C. C. Skipper, D. J. Taylor, Mrs. Ernestine B. Thurman, H. T. Vanderford, R. K. Voorhees, R. T. Wallace, M. J. Westfall.

Associate membership: J. C. Alden, R. F. Allen, Major F. S. Blanton, James M. Coarsey, Jr., K. Coleman, George Cooper, C. J. Dumas, F. E. Fisher, H. G. Ford, A. N. Fox, Irving Fox, G. H. Gilbert, Tom Hill, A. E. Holland, Max Isbill, P. E. Kaspar, C. D. Kime, Jr., L. C. Kuitert, Hamilton Laudani, W. S. Lee, D. B. Lieux, W. C. McDuffie, Harry Mayfield, C. M. Meadows, F. A. Morton, Joe Nicholson, Theodore Oser, James Sewell, W. V. Shock, R. P. Tomasello, S. H. Walkup, Phil Westgate, J. F. White, E. H. Wilson.

Student membership: A. L. Altman, Ralph Chisolm, Robert E. Dixon, Frank Douthit, Frank Lee, William Neel, Daniel Sudia.

Honorary membership: Dr. Charles T. Brues and Dr. James G. Needham.

It was moved and seconded that the candidates for the repective memberships submitted by the membership committee be accepted into the society. The motion was passed unanimously.

The auditing committee was then asked to present its report. This was accepted by the society.

The report of the secretary was approved without reading since it had been published in Volume 31, Number 1, of the FLORIDA ENTOMOLOGIST. The president then called for old business. The secretary announced that following the authorization of the Society at the 1947 meeting to secure subsidization for the publication of the FLORIDA ENTOMOLOGIST, he talked with the librarian of the University of Florida about the matter. It was suggested by the librarian, Mr. Stanley West, that instead of the society receiving a subsidy, it might sell one hundred subscriptions to the University of Florida, and the library might then use these copies for exchange purposes. Mr. West pointed out to the secrtary that several other journals now have a similar arrangement with the University of Florida library. It was moved and seconded that the society cooperate with the University of Florida in this matter and permit it to purchase the number of copies of the journal that it would require for its use in conducting inter-institutional exchanges. There was no further old business.

The president followed by asking for new business. Mr. Dekle introduced the subject of payment of costs of printing tabular material and illustrations published in the FLORIDA ENTOMOLOGIST. He suggested that it might be possible, provided additional advertisements were sold, to publish tables and illustrations without cost to the author. Considerable discussion followed this proposal, resulting in the presentation of a motion by Dr. Griffiths that charges to authors for illustrations and tabular material be left to the discretion of the editor and business manager, but that the editor and business manager be empowered to allow the publication, without charge, of one zinc etching, not to exceed one-half page in size, or the equiva-

lent thereof. The effective date of this motion to be December 2, 1948. The motion was seconded and passed by the society.

Dr. A. N. Tissot then read a letter received from the entomologist in Germany who was the recipient of the food packages purchased with the money collected at the 1947 annual meeting. He expressed his sincere thanks to the members for their kindness in sending the food for his family and himself.

Dr. Kelsheimer called for the report of the nominating committee; the chairman, Dr. Tissot, submitted the following candidates for the offices of the society during the year 1949:

President—M. C. Van Horn
Vice-President—J. A. Mulrennan
Secretary—Lewis Berner
Editor of the FLORIDA ENTOMOLOGIST—H. K. Wallace
Associate Editor—G. B. Merrill
Member of the Executive Committee—C. F. Ladeburg (two year term)

There were no nominations from the floor. It was then moved and seconded that nominations be closed. Mr. Bruce requested that the secretary be instructed to cast a unanimous ballot for the election of the above named candidates. This was passed by the society. The society adjourned the Thursday morning session at 11:50 A. M.

The Thursday afternoon meeting was called to order by Dr. Kelsheimer, who turned the chairmanship over to the incoming president, Mr. M. C. Van Horn. Mr. Van Horn then continued with the presentation of the program as scheduled.

The last paper was completed at 3:15 P. M. and the thirty-first annual meeting of the society was adjourned.

A total of ninety persons signed the attendance registry.

Respectfully submitted,
LEWIS BERNER, *Secretary*

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following Chewing and Sucking INSECTS

- **Ants**
- **Grasshoppers**
- **Leaf Miners**
- **Cutworms**
- **Fall Army Worms**
- **Mole Crickets**
- **Cucurbit Insects**
- **Wireworms**
- **Hornworms**
- **Grubs**
- **Thrips**
- **Pumpkin Bugs**

The elimination of **Chlordane** residue three weeks following application has been proven chemically and biologically.

Formulated into emulsified concentrates, wettable powders, and dusts by leading insecticide manufacturers.

Write for technical bulletins and data.

Julius HYMAN & Company*

DENVER, COLORADO

*Manufacturers of OCTA-KLOR
(T. M. Reg. U. S. Pat. Off.)
Technical Chlordane

EASTERN SALES OFFICE
11 West 42nd St.
New York 18, N. Y.

FOR BETTER CONTROL OF MORE INSECTS

use insecticides containing

Thiophos

(REG. U. S. PAT. OFF.)

PARATHION

Commercial use of THIOPHOS Insecticides in 1948 confirmed the outstanding results obtained experimentally in 1947.

Such insects as aphids, mites, beetles, mealy bugs, and thrips are among the more important pests which are easily and economically killed with Wettable Powders and Dilute Dusts containing THIOPHOS Parathion.

THIOPHOS Insecticides are supplied by well-known manufacturers under their own brand names. Select one of these reliable manufacturers as your source of supply and discuss with an accredited representative your insect problem. Do the same with Federal and State Agricultural experts in your locality.

AMERICAN Cyanamid COMPANY

AGRICULTURAL CHEMICALS DIVISION
BREWSTER, FLORIDA

TOXAPHENE

(HERCULES CHLORINATED CAMPHENE 67-69% Chlorine)

SOLUBILITY OF TOXAPHENE IN COMMON SOLVENTS

SOLVENT	POUNDS OF TOXAPHENE PER GALLON OF SOLVENT AT 27° C.
ACETONE	OVER 40
BENZENE	OVER 40
CARBON TETRACHLORIDE	OVER 40
ETHYLENE DICHLORIDE	OVER 40
FUEL OIL	20-25
HEXANE	OVER 40
KEROSENE (REGULAR)	OVER 25
KEROSENE (DEODORIZED)	OVER 25
LUBE OIL	5-7
SHELL E-407	OVER 25
SOLVACIDE 544C	OVER 25
SUN SOLVENT 1547	OVER 25
THANITE*	8-10
TOLUENE	OVER 40
WHITE OIL 50	4-5

HERCULES

FOR AGRICULTURAL INSECTICIDES

Toxaphene is a synthetic organic insecticide toxicant, 100 per cent chlorinated technical grade camphene, developed by Hercules primarily for use in agricultural insecticides. It is an amber-colored, waxy solid with a mild odor suggestive of both chlorine and camphor.

Dusts and sprays based on Toxaphene have been effective experimentally against more than 50 species of economically important insect pests. Hercules Toxaphene is economically priced and easy to work with. It is readily soluble in non-polar organic solvents, as shown in the table at the left. This property can facilitate the preparation of experimental formulations, particularly concentrate-type sprays.

For specific technical information on Toxaphene, either its insecticidal merits or its physical and chemical properties, we suggest you get in touch with us.

HERCULES POWDER COMPANY
INCORPORATED
949 King Street, Wilmington 99, Delaware

NX8-1-R

*REG. U. S. PAT. OFF.

PROTECTION PLUS—

BLACK LEAF 40

KILLS The APHIDS but SPARES Lady Beetles and other beneficial insects

BLACK LEAF 40 FIGHTS ON YOUR SIDE TWO WAYS

PROTECTS THE GARDEN
against the myriads of sucking insects which swarm almost overnight. Non-caustic. Leaves no stain on flowers, foliage or fruit.

PROTECTS THE ORCHARD
Black Leaf 40 controls aphids that deform foliage and fruit, and leafhoppers that devitalize foliage. Compatible with other standard spray materials.

DELOUSES POULTRY—
by means of Cap-Brush Applicator found in each small package. Just tap on roosts. Black Leaf 40 fumes kill body lice while chickens roost.

THE "OLD RELIABLE" DIP AND DRENCH
Black Leaf 40 controls stomach worms of sheep and goats, and used as a dip, controls certain pests on livestock.

Aphids and other similar insects would over-run the world, were it not for the fact that they have enemies which constantly prey upon them. Lady beetles, aphid lions, lace-wing flies and similar beneficial insects are essential in maintaining nature's balance.

Spraying with Black Leaf 40 kills the aphids *without destroying beneficial insects* that fight on the side of mankind. Use it, and *differentiate* between your insect *friends* and insect *enemies*, for added crop protection.

Kills two ways—by contact and by fumes. Black Leaf 40 kills aphids, leafhoppers, mealy bugs, most thrips, leaf-miners, and similar insects.

ONE PRODUCT — MANY USES

Black Leaf 40 is "the old standby"—for controlling various plant, poultry and animal parasites. Used the year 'round. Keep it handy for quick results. Directions on package.

LOOK FOR THE LEAF ON THE PACKAGE

4801A

"Black Leaf"

A GREAT NAME IN INSECTICIDES

Black Leaf 40
Black Leaf 155
Black Leaf Mosquito-fumer
Black Leaf Powder
Black Leaf Dry Concentrate
And Other Nicotine-Base Products

TOBACCO BY-PRODUCTS & CHEMICAL CORPORATION LOUISVILLE 2, KENTUCKY